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VOL. I.—14TH YEAR. SYDNEY: SATURDAY, MAY 21, 1927. No. 21.

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THE PATHOLOGICAL LESIONS PRESENT IN ONE THOUSAND CONSECUTIVE AUTOPSIES IN THE ADELAIDE HOSPITAL.[1]

By J. BURTON CLELAND, M.D. (Sydney),
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DURING the five and a quarter years from 1920 to 1925 one thousand *post mortem* examinations have been carried out at the Adelaide Hospital. The great majority of these have been done by myself and in most of the other cases I have inspected the specimens, examined microscopical sections or discussed the results with the operator.

A summary has been kept in tabular form of all the pathological lesions present, whether associated with the patient's last illness or not. It has seemed of value to sum up and discuss the various lesions met with in this series of cases; a kind of work which as far as I know, has not yet been attempted in Australia. The value of this systematic tabulating in a long series lies in its revealing the possible unexpected incidence of certain diseases, as for instance in this series, of degenerated hydatid cysts; in its revealing the association or lack of association of one condition with another, for example, cancer and gall stones and in its leading to a note being kept of unusual pathological lesions of minor importance, but nevertheless of interest.

The pathological lesions have been grouped under various headings according to the systems affected. When a variety of lesions have been present in one body this may have necessitated a summary of the findings being placed under perhaps six or eight separate headings. In this paper it is proposed to give merely a broad general survey of the more important lesions present. Other workers and collaborators will, it is hoped, help in working up the pathological lesions present in particular systems in which they are interested.

An important point to decide is whether or not the results of the examinations of these one thousand bodies represent the lesions to be met with amongst the adult population of South Australia when death occurs. In the Adelaide Hospital children under ten years are not often admitted; they usually go to the Children's Hospital. The deaths occurring at the Adelaide Hospital and its attached cancer block, infectious diseases block and consumptive home, probably represent fairly closely the adult sick population of the State in general. Even slowly dying persons are probably fully represented here. If *post mortem* examinations were carried out after all deaths, this might represent fairly accurately the lesions met with at death amongst the general community. Actually autopsies are carried out on a little less than half of the patients who die. Permission is always asked. Autopsies are held by the coroner's orders in nearly all cases of death from violence. Deaths from violence, therefore, occupy an unduly high proportion (12%) of the autopsies. There is also a sex selection. Men and women presumably die in approximately equal proportion, but we find that only 28·4% of our autopsies were on women and 71·6% on men. It is probable that autopsies are more readily obtained in the case of elderly persons, especially elderly men; their children have grown up, married, have families of their own and have become scattered and so objections are thus less likely to be raised.

It was thought that by obtaining from the Government Statistician the numbers of males and females dying in the years 1920 to 1924 in decennial periods from ten to twenty years and upwards and comparing the percentages with those of the *post mortem* material, we might be able to ascertain whether the cases coming to autopsy did represent in a broad sense the deaths of adults in the community at large. The accompanying table shows the results of this comparison. Males and females are given separately. In the *post mortem* material the first age period is from one to twenty, but the number of children under the age of ten on whom autopsies were held, was practically negligible. The statistician's figures are, however, only from ten to twenty, thus excluding the high percentages of deaths due to infantile mortality. In the *post mortem* material the age periods are taken as twenty-one to thirty, thirty-one to forty *et cetera*. It will be noted that the statistician's figures are from twenty to thirty, thirty to forty *et cetera*. The number of autopsies held within the age period concerned is also given.

It will be seen that in males about one-fourth (24·4%) of the autopsies obtained are held on bodies of persons between the ages of sixty-one and seventy and in the population of the State 22·7% of males over ten years of age who die are between the ages of sixty and seventy. Over half (56·9%) of the autopsies on males are on the bodies of persons between the ages of fifty-one and eighty and over half (58·8%) of the deaths of males over ten years are of persons between fifty and eighty. On looking at the table it will be seen, however, that relatively more *post mortem* examinations are obtained in the age period fifty-one to sixty than in the age period seventy-one to eighty, the statistician's figures being practically a reverse of this position.

It will be seen also that for both males and females we obtained a higher percentage of *post mortem* examinations in the earlier decades than might be expected from the statistician's figures, whereas from seventy-one upwards in males and from sixty-one upwards in females a smaller percentage of *post mortem* examinations are obtained than might be expected. The explanation of this is apparently simple. Most of the deaths at an advanced age period are due to senile diseases which more or less gradually and quietly lead to the death of the patient in his or her home surroundings. Probably comparatively few of these patients end their days in hospital. In the earlier decades illness tends to be more violent and hospital treatment offers a better chance for cure or relief and the

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 31, 1927.

TABLE SHOWING COMPARISON OF NUMBER OF AUTOPSIES WITH THE NUMBER OF DEATHS.

Age Period.	Males.			Females.		
	Number of Autopsies.	Percentage to Total Autopsies.	Percentage of Statistician's Figures.	Number of Autopsies.	Percentage to Total Autopsies.	Percentage of Statistician's Figures.
1-20	47	7·2	(10-20 years) 4	28	10·4	(10-20 years) 4·4
21-30	47	7·2	(20-30 years) 6·4	41	15·2	8
31-40	79	12	8	49	18·1	10·4
41-50	84	12·8	9·6	46	17	9
51-60	131	20	14·6	45	16·6	12·2
61-70	160	24·4	22·7	43	15·9	18·1
71-80	82	12·5	21·5	12	4·4	19·8
80-	25	3·8	13·3	6	2·2	18
Total	655	—	10,529	270	—	8,825

patients are taken there. In spite of the natural dislike to granting *post mortem* examinations, quite a big percentage of autopsies is obtained, especially in cases presenting unusual features, in patients who have died in the prime of life.

It would therefore appear that the results found in these one thousand autopsies do not represent more or less accurately the lesions that occur amongst the adult population at large who die. There is an undue preponderance of accident cases as the result of *post mortem* examinations carried out at the request of the coroner. There are fewer *post mortem* examinations carried out on the bodies of patients of advanced years who tend to die more in their homes than in hospital. Between the ages of forty-one and seventy, however, the results probably do approximate to those met with in the population at large.

The age was not recorded in seventy-five instances. In the remaining 925 cases, 655 were males and 270 females. The average age of the males was 45·5 years and of the females 44·6 years.

Analysis of Lesions.

Infective Diseases.

Deaths from infective diseases are poorly represented. There were only ten from enteric fever. One patient died from anthrax and two from diphtheria. One patient died from *periarteritis nodosa* which may possibly be due to the action of some virus. Three patients are listed under Brill's disease, the mild typhus-like infection that has been described by Dr. Hone, of Adelaide. In one of these cases the death was unassociated with the Brill's disease and occurred during convalescence and in the other two complications were responsible. Two patients died of tetanus. Extensive pulmonary tuberculosis was present in seventy-three cases (7·3%) and in twenty-nine more it was present but slight and relatively insignificant. Eighteen other patients had tuberculosis of other parts. In many other cases there was evidence of old or healed tuberculosis. In only two patients was there evidence of amyloid disease. Three patients had actinomycosis and one an acid-fast infection which has already been recorded.

Vascular System.

In twenty-six pericarditis was found and in seven an adherent pericardium. Seventy-four patients are listed as having hypertrophied hearts and varying degrees of chronic interstitial nephritis; twenty-three others had hypertrophied hearts, not explained by valvular or renal disease. In twenty-one cases (2.1%) there is evidence of rheumatic affection of the valves, usually old. In twenty cases there was malignant or vegetative endocarditis. In twenty-three cases valvular disease was present, but apparently was not due to acute rheumatic fever or was not of the vegetative type. In thirteen cases there were infarcts of the heart muscle. Infarcts in various organs were present in fifty-four cases (5·4%).

Massive pulmonary embolism was noted as the cause of death in fourteen. Thrombi were present in the chambers of the heart in eleven cases. Aneurysms occurred in twenty-one. In nearly all of these there was evidence of syphilis, either in the shape of a positive response to the Wassermann test or in the appearance presented by the aorta. In one case the aneurysm seemed to be definitely of atheromatous origin. In addition to most of the aneurysms seventeen other bodies manifested syphilitic aortitis or syphilitic aortic disease.

Respiratory System.

There were fifty-two cases in which lobar pneumonia was present. In fifty-nine cases bronchopneumonic areas were present and four additional bodies manifested lung lesions like those met with in the great influenza epidemic. Hypostatic pneumonia occurring during slow dying was seen in a decided degree forty-four times. A remarkable feature has been the relative prevalence of organization of the exudate following either a lobar pneumonia or a bronchopneumonia. Twenty-six cases have been listed under this heading. This figure is probably too high, the extent of organization being in some of these cases relatively trifling. In several definite carnification had occurred and in a number the consolidated lung tissue was unduly tough. Evidently organization of a pneumonic exudate is commoner than is generally thought and deserves more consideration in textbooks. It is from these organ-

ized lungs that we believe several cases of primary carcinoma of the lung have been derived. Two cases of such carcinoma of the lungs were met with in this series and we know of one occurring in private practice in addition. Silicosis, usually very pronounced with stony hardness, was met with twelve times.

Renal System.

Chronic interstitial and fibrotic changes in the kidneys, with or without hypertrophy of the heart, are noted in 188 cases or nearly 19% of the autopsies. In addition in eleven cases more or less complete atrophy of one kidney was present and in two other cases interstitial changes were associated with dwarfism or small stature. In eleven cases there were present kidney lesions which might be classified as acute or subacute nephritis not due to the actual presence of bacteria.

Renal or vesical calculi were present in twenty-five bodies.

Alimentary System.

Ulcers of the stomach were noted in nineteen bodies and ulcers of the duodenum in twelve. Subphrenic abscesses were recorded in eleven. Dysentery or colitis was met with sixteen times. In fifty-one bodies gall stones were present, but in only three of these were the gall stones associated with malignant disease in any part of the body. These figures do not give support to the view that there is any special association between the presence of gall stones and the development somewhere of cancer. Fourteen patients were diabetics.

Nervous System.

Seven patients had tuberculous meningitis and eighteen meningitis due to other organisms. Fifty patients died from cerebral hæmorrhage and twenty-six showed signs of cerebral softening. In six cases there were aneurysms of the circle of Willis, five of which had ruptured and given rise to death. Five patients were recorded as having died from encephalitis. A tuberculoma of the brain was met with only once. Syphilitic disease of the brain, apart from general paralysis of the insane and locomotor ataxia, was recorded four times. Gumma was present in one of these.

There were sixteen examples of tumours of the brain, of which eight were classifiable as gliomata (including higher types of nerve cell tumours). Three were cerebello-pontine angle tumours, of which two were responsible for death and one, a small one, was found in a man who was accidentally killed by a motor car after having been knocked down by a motor cycle. A pituitary cyst was present in one case and a cyst of the optic thalamus in another.

Malignant Disease.

In one hundred and twenty-eight bodies (12·8%) malignant disease was found, which in most cases was responsible for death. Only eight of these were sarcomata, two were melanomata, one an endothelioma and one was believed to be a myeloma (not giant celled). One hundred and sixteen cases were examples of carcinomata. The primary growth had arisen in the stomach in thirty-six cases, in the colon in eleven, in the prostate in seven, in the liver in five and in the pancreas in five.

Accidents.

Trauma, usually motor accidents, was directly or indirectly responsible for one hundred and twenty deaths—an unduly high proportion explainable by the coroner requiring autopsies on nearly all deaths from violence.

Hydatid Disease.

Hydatid cysts were responsible for death in five cases and were found accidentally to be present, usually in a very degenerated condition, in eighteen more. It thus appears that in 2·3% of these autopsies infestation by hydatid disease was found. Probably amongst the adult population dying about 2% would show the presence of living or dead hydatid cysts.

Other helminths were noted in only two autopsies, namely ankylostomes in one case (an Indian) and threadworms in another.

Blood Diseases.

Autopsies were obtained on ten cases of pernicious anæmia, on two of aplastic anæmia, on one patient with a profound anæmia associated with pregnancy, on seven cases of leuchæmia, on one of purpura and on three of Hodgkin's disease.

Various Conditions.

In four cases there was no apparent sufficient cause for death, that is, no lesion was found so pronounced that it could be regarded as likely to have been responsible for the death of the patient.

Gout is noted as occurring only once.

One patient died as an aftermath of an iodide rash. This had been profuse and pustular on the face and tongue and had been succeeded by a secondary infection which finally led to purulent pericarditis. The case has been recorded.

Old rickets was noted in two patients.

Senility was the attributive cause of death in one case.

Twenty-five patients were pregnant and in most of these the pathological condition was associated with this state.

CARCINOMA OF THE STOMACH, GASTRIC ULCERS AND DUODENAL ULCERS IN ONE THOUSAND CONSECUTIVES AUTOPSIES AT THE ADELAIDE HOSPITAL.[1]

By J. BURTON CLELAND, M.D.,
Marks Professor of Pathology, The University of Adelaide, Honorary Pathologist, the Adelaide Hospital.

Carcinoma of the Stomach.

Age and Sex Incidence.

IN the thousand autopsies, there were thirty-six cases (3·6%) of carcinoma of the stomach, of which thirty were in males and only six in females.

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 31, 1927.

No age is stated in connexion with one male, leaving twenty-nine patients the average age of whom was 57·5 years or, if we exclude the two patients who were unusually young, namely eighteen and thirty-one years of age, the average is sixty. Six individuals were in the forties, seven in the fifties, ten in the sixties, four in the seventies, the oldest being seventy-five. The average age of the six women was 55·8; the youngest was aged thirty-three and the oldest aged seventy. Three of the patients were in the fifties and another in the sixties. The average age of the thirty-five patients was 57·2 years.

It thus appears that in Australia carcinoma of the stomach is rare below the age of forty, though exceptionally it may occur in the teens. On these figures, it is commonest in the sixties, both relatively and absolutely to those alive at that age.

M. J. Stewart[1] gives the age and sex incidence in 165 cases of carcinoma of the stomach, met with in the course of 7,900 consecutive *post mortem* examinations. His youngest patient was eighteen and the oldest seventy-six, figures almost identical with ours. Of his cases 82% occurred between the ages of forty and seventy. Just over 82% of our cases also occurred between the same ages. He had a sex incidence of 113 males and 52 females—a male preponderance of rather more than two to one. We had only six women to thirty men—a proportion of five to one.

The Site of Origin of the Growths.

As might be expected in patients dying from malignant disease of the stomach, the growth was often so extensive as to make it difficult or impossible to determine the exact site of origin in the mucosa of the stomach. In a number of cases, however, the greater extent of the growth in one or other part seemed to justify the conclusion that it had arisen there. Twelve cases (42·8%) of the cases in which localization was thus recognizable, appear to have arisen in the lesser curvature. In eleven instances (39·3%) the growth was in the pylorus or in its neighbourhood and usually on the posterior aspect. In four (14%) cases it was at the cardiac end; in only one case is the greater curvature mentioned and here the growth was unusual, consisting of an ulcer at the base of a polypus. In three cases the growth was very diffuse. In two gastrectomy had removed the growth and in one the growth encircled the centre of the stomach, giving rise to an hour glass constriction with a fundal dilatation above. This localization does not quite agree with the percentages of 120 cancer cases tabulated by Stewart. The figures for the cardiac end are in fairly close agreement (14% as against 16·5% in Stewart's cases). In the English cases there were only 11·5% on the lesser curvature, whereas apparently 42·8% of ours occupied this situation. We have 39·3% in the plorus and Stewart finds that 67% are in this situation. In classifying our cases, however, we have placed under "lesser curvature" those examples in which the growth was so located, even though it was near the pylorus, whereas Stewart has probably grouped his cases the other way about.

Secondary Deposits.

In twenty-six cases out the thirty-six secondary growths had appeared elsewhere. In twelve nodules were present in the liver. In fifteen the adjacent glands were invaded and in some of these cases the disease had spread further afield, involving the lymphatic glands along the aorta and in the mediastinum *et cetera*. In only two instances were the supraclavicular glands affected. In another case in which these glands were enlarged, the enlargement was found to be due to adenomatous thyreoid deposits and not to the cancer of the stomach. The peritoneoum was invaded and showed the presence of cancerous plaques to a greater or less extent in seven cases. In several of these the omentum was invaded, thickened and rolled up. Extension to the peritoneum and dispersion of carcinoma cells over its surface had led in various cases to deposits invading the small intestine and rectum, the small intestine, the transverse colon or the omentum and bladder respectively. Deposits had occurred in the spleen in two instances, in the kidneys in one and in the heart in one. A large growth was present in the pancreas in one case. Multiple subcutaneous nodules occurred in two instances. The pleura was involved in one case and the lungs in four. In one of these four cases there was an extensive permeation of the lymphatics of the lung by the cancer cells. In another case the distribution of the secondary growths suggested a bronchopneumonia which was excluded only on microscopical examination. Stewart in his account of the visceral metastatic deposits found that these occurred in the liver in 26·6 of the cases (our figures are 33·3%); in the ovaries, in 19·2% of the female bodies (we had in six women one with a deposit in the ovary); in the adrenals in 3·6% (we had no examples); in the kidneys in 1·8% (we had one case); in the pancreas in 1·8% (we had one example); in the spleen in 1·2% (we had two examples); and in the heart in 0·6% (we had one example).

Cases Presenting Unusual Features.

In the following cases unusual features were present.

Autopsy 19/24 was on the body of a male patient, aged thirty-one, who had suffered from symptoms pointing to a chronic ulcer of the stomach. An operation had been performed and this was excised. Macroscopically it appeared to be a simple chronic ulcer. The pathologist reported, however, that it manifested definite carcinomatous change. Later the patient developed firm subcutaneous nodules. Though these were excised several times and examined, they contained merely very dense fibrous tissue, although eventually a few cells, thought to be cancer cells, were recognized. Nevertheless, it was held that these nodules represented secondary deposits in which the carcinoma cells had been overcome by the dense fibrosis. Eventually abdominal symptoms developed, the liver became large and the patient died, the autopsy revealing secondary deposits in the liver and the glands.

The case has been recorded.[2]

In another case (autopsy 163/23) that of a male of fifty-five, subcutaneous deposits were present as well as deposits in the liver, the spleen, kidneys, heart, pleura and peritoneum.

Autopsy 18/23 on a male, aged forty-nine, revealed a mapping out of the lymphatic channels in the lungs by their being seeded with carcinoma cells. The supra-

clavicular glands were also enlarged and secondary thrombosis of the left subclavian vein had resulted and there were infarcts in the lung.

In very few instances were there suggestions that the malignant growth had supervened on a chronic ulcer. In autopsy 19/24 on a male, aged thirty-one, already mentioned, there seems little doubt that the carcinoma was secondary to a chronic ulcer.

In autopsy 194/21 on a male of fifty-nine the growth had also probably taken place on a chronic ulcer.

In autopsy 111/24 on a woman of thirty-three there was a small gastric ulcer, the wall of which had become malignant. There was also a malignant deposit in the ovary.

In autopsy 124/24 on a male of sixty-seven there were found two polypoid projections in the stomach, one from the lesser curvature and one from the greater. At the base of the latter polypus was a malignant ulcer. It seems safe to assume that the malignant disease was secondary to the polypus.

In autopsy 192/24 on a male, aged sixty-five, who died from pyelonephritis and had extensive bedsores, there was a raised papillomatous mass in the stomach which proved microscopically to be malignant.

Association with Tuberculosis.

In only two instances was there an associated tuberculous lesion of moment.

In autopsy 151/24 on a male of sixty-four there was very extensive pulmonary tuberculosis of an unusual type with extensive cords of necrosed material in which were numerous tubercle bacilli. The pulmonary lesion here was chiefly responsible for the death of the patient.

In autopsy 78/25 on a male of fifty-nine with an hour-glass shaped stomach as a result of carcinoma there was a small area of pulmonary tuberculosis.

Complications.

The following complications were met with:

In autopsy 18/20 on a woman, aged sixty-six, a secondary deposit in the liver and an infarct in the lung were found.

In autopsy 23/20 on a male, aged sixty-eight, spots of fatty necrosis in the pancreas were found.

In autopsy 38/21 on a male, age unstated, deposits in the liver, acute cholecystitis and a subphrenic abscess were found.

In autopsy 102/21 on a male, aged fifty-nine (?) with a carcinoma of the lesser curvature, an abscess in the adjacent liver, peritonitis and a purulent condition over the left wrist were found.

In autopsy 154/21 on a male, aged sixty-five, the pylorus and lesser curvature were affected. The growth had extended to the peritoneum and peritoneal seeding had followed. A secondary deposit had encircled the ileum some little distance above the caecum giving rise to a secondary ring carcinoma anchoring the ileum to the pelvic brim and extending to and compressing the right ureter. This had led to a right hydronephrosis. Another deposit had occurred in the pelvis invading the rectum from the serous aspect.

In autopsy 90/22 on a boy, aged eighteen, a large growth in the stomach and carcinomatous peritonitis were found with secondary distension of the bile ducts.

In autopsy 160/22 on a male, aged fifty-four, a polypoid and infiltrating carcinoma of the stomach was found. There were pancreatic calculi and fibrosis and infarcts in the lung and thrombi adherent to the pulmonary artery.

In autopsy 84/23 on a male, aged forty-nine, extensive permeation of the lymphatics of the lungs and a malignant deposit in one of the supraclavicular glands were found. Secondary thrombosis of the subclavian vessels had occurred and there were infarcts in the lungs.

In autopsy 59/24 on a male, aged sixty-four, carcinoma of the stomach, a secondary anæmia and bronchopneumonia were found.

In autopsy 60/24 on a male, aged forty-nine, carcinoma of the stomach was found with secondary anæmia and pulmonary tuberculosis which apparently had been arrested.

In autopsy 78/25 on a male, aged fifty-nine, a contracted hour glass carcinoma of the stomach with a fundal diverticulum was found. An infarct of the spleen, lobar and hypostatic pneumonia and a small area of pulmonary tuberculosis were also present.

Carcinomata Found Accidentally.

In two bodies the malignant growth was found accidentally at the autopsy and was not the cause of death. One was that of a male, aged sixty-seven, who died from patchy lobar and bronchopenumonia; a polypus of the stomach with a malignant ulcer at its base was found. The other was that of a patient, a male of sixty-five, who died from pyelonephritis with thrombosis of a saphenous vein; a papillomatous, malignant area was found in the stomach

Lesions Present Unconnected with the Carcinoma.

Several patients had other lesions, of greater or less importance, in no way associated with the malignant growth.

Thus a woman of fifty-three on whom gastrectomy for the growth had been performed and who was found to have localized peritonitis, had only one kidney. A male of fifty-nine whose case has been reported, had undoubted pernicious anæmia apparently preceding the development of the growth. A male of seventy had syphilitic aortitis and atheroma with some dilatation of the aorta as well as arteriosclerotic kidneys Two patients had old hydatid cysts of the liver. A male Portuguese Indian of forty-six had large adenomatous thyreoid deposits in the glands of the neck.[2] A woman of fifty-nine had atheroma of the aorta, thickened mitral valves, infarcts in the kidney and a softened area in the brain. A male of sixty-four had extensive pulmonary tuberculosis with large areas of caseation containing numerous tubercle bacilli and also pyelitis.

Ulcer of the Stomach.

Under the heading "Ulcer of the Stomach" eighteen cases are listed.

These include the case of a woman, aged seventy-one, suffering from mitral stenosis, atheroma and gall stones, who had also healed pyloric and duodenal ulcers.

Another woman, age not stated, had advanced chronic interstitial nephritis, an hypertrophied and dilated heart, atheroma of the aortic cusps and of the coronary and cerebral vessels, a gall stone and patches of coagulation necrosis in the mucosa of the stomach, which it is clear must have been followed, had the patient lived, with the formation of actual ulcers as a result of the digestion of the dead tissue.

A woman, aged thirty-three, had a small ulcer, considered to have been primarily a simple one but which showed malignant infiltration of its wall, together with extensive malignant permeation of the lungs resembling a broncho-pneumonia and a malignant growth (probably a deposit) in the ovary.

Lastly, a man, aged thirty-one, refered to under "Carcinoma of the Stomach," had an apparently simple chronic ulcer excised, which the pathologist pronounced to be nevertheless malignant. This patient died later from secondary abdominal deposits after the appearance of numerous fibrosing secondary subcutaneous deposits.

In the remaining fourteen cases simple unhealed ulcers were present.

Considering the eighteen cases together thirteen were in males and five in women. The ages of one male and one female are not stated. The average age of the remaining males was 61·1 years and of the four females 47·5 and of both sexes together 57·7 years. Of the males the youngest whose ulcer had

become malignant, was aged thirty-one, the next was aged forty, three were in the fifties, four in the sixties, two in the seventies and one was eighty-three. Of the women, the youngest, aged thirty-three, had malignant infiltration of the ulcer, the next was aged thirty-seven, the next forty-nine and the last, aged seventy-one, had healed pyloric and duodenal ulcers. It will be seen that the average age of the males, 61·1 years, is higher than the average age in males for carcinoma of the stomach and the same holds good for the average of both sexes, namely 57·7 as against 57·2, but the average age of the four females, 47·5, is less than for carcinoma of the stomach, 55·8 years.

In several cases the ulcers met with were quite unexpected. Thus a melancholic male of fifty who committed suicide by cutting his throat, was found to have four acute ulcers in his stomach and an atrophied right kidney. It is possible that these other lesions may have contributed to his mental condition and its outcome. Another male of sixty-five had pulmonary tuberculosis with a cavity, tuberculous ulcers of the intestine, *paralysis agitans* (?), gall stones and an acute ulcer of the stomach.

Again, a male of sixty-nine died from subdural non-traumatic hæmorrhage and had, besides moderate atheroma of the aorta, some hypertrophy of the left ventricle and early red granular kidneys, a chronic ulcer of the stomach.

Three of the eighteen had gall stones and four had definite atheroma. In two of the latter the atheroma was thought to have been possibly the cause of the stomach condition, especially in the woman who had the small patches of coagulation necrosis.

In two patients malignant disease was the cause of death, in one peritonitis following gastrectomy, streptococcal orbital cellulitis in another, rupture in two and subphrenic or other abscesses in the neighbourhood of the stomach in two.

Duodenal Ulcers.

In eleven cases (1·1%) duodenal ulcers, either healed or unhealed, were found. Nine of the patients were males and two were females. The average age of the males was 57 years and of the women 52 years and of both together 56·41 years. The youngest was a male patient, aged twenty-eight, who had suffered from *delirium tremens* and who had a fibro-fatty liver. The youngest but one was a woman, aged thirty-eight, in whom the ulcer had ruptured with resulting peritonitis. The oldest was a man, aged eighty-four, who died from chronic nephritis and had healed duodenal ulcers. In four cases the ulcers had healed and in one of these a healed gastric ulcer was found. One patient, a male of seventy-six, died from hæmorrhage from a chronic duodenal ulcer. The two women, aged thirty-eight and sixty-six respectively, both had peritonitis from rupture of their ulcers. Three patients had subphrenic abscesses secondary to the ulcer. One of these, a male of forty-three, had peritonitis, a subphrenic abscess and secondary purulent pericarditis. Another male, aged forty-seven, had two duodenal ulcers one of which had ruptured, a subphrenic abscess, double empyema and purulent pericarditis. Another male, aged forty-seven, had been operated on and developed a subphrenic abscess and pneumonia. The remaining patient was a man of sixty-eight with an enlarged prostate containing a small abscess and with atheroma of the cerebral vessels, who had two small duodenal ulcers.

References.

(1) M. J. Stewart: "The General Relation of Carcinoma to Ulcer," *The British Medical Journal*, November 14, 1925, page 882.
(2) *Medical and Scientific Archives of the Adelaide Hospital*, Number 4, 1924.

THE TYPHUS-LIKE EPIDEMICS OF AUSTRALIA: A PRELIMINARY COMMUNICATION.

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CASES of the typhus-like disease have been occurring in Western Australia since the end of last year, the first affected person that I saw, was in Perth Hospital in the latter end of December, 1926. From one or two symptoms of this case I came to the conclusion that the disease instead of being typhus was in all probability intestinal in origin, so I determined to investigate it along that line.

I sent out bottles of sterilized bile for blood cultures and incubated these and then plated on McConkey agar. The first blood I received for culture was early in January and I have been receiving them at intervals since, altogether I have had about a dozen.

On February 26, 1927, I obtained some tiny white colonies on a plate; these in forty-eight hours became purple (Case W., Fremantle Hospital).

The organisms on an agar slope grew fast and gave by transmitted light a slightly greenish appearance, the appearance of the growth was rather like *Bacillus flexner*. They grew well at room temperature and very fast at 37° C. The organisms were very large pleomorphic Gram-negative bacilli, somewhat curved and they really looked like tiny worms in appearance. The organisms fermented glucose, lactose, mannite, dulcite and saccharose, all without gas. They did not produce acid in lactose till the second day. They did not form indol or liquefy gelatin or blood serum or clot milk. The organism is an autoagglutinator, any serum will bring it down.

As soon as I saw the organism I recognized having seen it before in one of my previous cultures (Case S., Fremantle Hospital), but as this particular culture was contaminated, I just regarded this curious looking organism as being an extra contaminant. The organism has been isolated again (Case H., April 5, 1927). A sample of blood was brought in a test tube by a doctor for the Weil-Felix

reaction, in a case he suspected of being the typhus-like disease. The blood was clotted, so it did not appear very favourable for culture. However, it was tipped into a petri dish and the clot in the shape of a sausage was lifted up by forceps and dropped into a bottle of bile which was then thoroughly shaken up.

The organisms in this case seemed very slow in developing and unlike those in the previous case where they appeared as a few definite discrete colonies. Here they appeared in great profusion on the plate, but were so small as not to be quite clearly recognizable till viewed by a hand lens.

Since the beginning of March, I have been working at the immunization of rabbits with this organism, the work is not yet complete and the results will have to be communicated at a later date.

INFLUENZA.[1]

By J. P. MAJOR, M.D. (Melbourne),
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IN dealing with that very contagious disease, influenza, I propose touching but lightly on its bacteriological and pathological aspects.

Influenza is always with us, but from time to time epidemics, practically world-wide, have occurred, the last being the disastrous one of 1918-1919, and apparently very similar in all essential aspects to the epidemic of 1890. It is difficult to come to any definite conclusion why such a disease should from time to time become pandemic and take on such a virulent form. It does not seem to depend on hygienic or dietetic conditions as was suggested and disproved in theatres of war in 1918; for example, in France, where it was pointed out the conditions of life from the morbidity point of view were if anything superior to those of the preceding years and in any case such causes would not apply to many other countries that were afflicted in that same period. It seems more probable that from time to time conditions arise that favour the growth of the causal organism or render it far more virulent or both.

Ætiology.

There still seems to be some doubt as to how far Pfeiffer's bacillus is responsible for the disease. It is found frequently in the sputum of patients, although apparently failure to do so is common in the first few days of the illness and this has been ascribed to the fact that growth of the organisms is taking place in the mucosa of the respiratory system at a stage of the disease in which naturally there is usually very little secretion.

It also commonly occurs in the pneumonic lesions and in some severe cases has been found in cultures from the blood and also in the cerebro-spinal fluid in some cases complicated by meningitis.

Despite these facts many bacteriologists in the 1918-1919 outbreak questioned that this bacillus was the main factor at work, as had till then been commonly accepted. They inclined to the belief that some unknown filter-passing organism was responsible for the disease and working at the Rockefeller Institute, Olitsky and Gates isolated in influenza cases a minute bacillus which they named *Bacillus pneumosintes*. Some confirmatory evidence of their work has appeared, but the question of the causal organism has not been settled.

Since this was written D and R. Thomson (*The Lancet*, January 29, 1927) have reported the discovery from the nasal mucosa and blood in what appeared to be a case of true influenza of a streptococcus of unusual type. They did not, working under particularly favourable conditions, find the *Bacillus pneumosintes*. However, while the nature of the causal organism is being investigated, I believe there is no room for doubt that in the complications of influenza we have to dread and combat most the toxic effects on the organism of the streptococci and pneumococci. It is the active participation of one or both of these two groups that is the cause of most of the serious complications, pneumonia, empyema and so on and was the principal cause of the extremely high mortality in the last great pandemic.

The Illness.

The incubation period appears from the figures of a large number of observations to be from two to four days and in my experience there are usually no symptoms during this stage. The onset of the illness is usually sudden and initial rigors are common. Fever, often of high degree, headache, pains in the back and limbs, sore throat, a tracheitis extending to a bronchitis, are all commonly present and associated with these is usually a profound degree of prostration. There is a great tendency for the catarrh of the upper air passages to extend and merge into bronchopneumonia of a very serious type. In the milder and uncomplicated cases the temperature tends to fall at the end of twenty-four or forty-eight hours and in a large series of charts that I have studied, the patient was non-febrile by about the fourth day. It will be noted that in these cases there are no signs or symptoms that may be regarded as pathognomonic of the disease and so it is difficult and often impossible to decide on clinical grounds only whether such patients are suffering from true influenza in a mild form or from an ordinary acute catarrhal infection. The same symptoms are common to both, with the exception that the backache and the prostration are usually much more pronounced in the influenza cases. And it follows that the physical signs are apt to be the same; scattered rhonchi and crepitations with perhaps some harshness of the vesicular murmur and without any impairment of the percussion note.

Vomiting is not uncommon at the onset and some of my patients presented rashes, the most important of which were hæmorrhagic in character. On going

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 6, 1927.

through a small series of histories, about one hundred picked at random, I found notes of four patients with petechial or purpuric rashes and three of these ran normal courses to recovery. This surprised me, but perhaps a study of a much larger series might cause me to think that such rashes were evidence of a more profound infection than usual.

So much for the milder forms. The more severe cases were those in which a tracheo-bronchitis merged into bronchopneumonia, lobar pneumonia itself being a rare accompaniment of influenza.

Instead of classifying these cases into those with bronchiolitis, those with alveolitis and so on, I prefer to look on them all as affected with pulmonitis, that is to say, they are pneumonic.

They to my mind more naturally fall into one of two classes. Firstly the common type, such as is so often seen accompanying measles, pertussis *et cetera* and, secondly, those highly toxic types running a course of two to ten or twelve days with high fever, a lilac pallor or cyanosis, great dyspnœa, anxiety, restlessness and perhaps delirium, many patients dying within two to four days of the onset. The physical signs in both these classes vary much in individual cases. Many patients present chiefly the evidence of a widespread bronchitis, although in nearly all many fine crepitations can be found, usually at one or both bases. The diagnosis is made not uncommonly more on the symptoms and course of the illness than on the physical signs. Much more commonly the ordinary physical signs of consolidation can be found in one or both lungs. The reason for these discrepancies is seen when *post mortem* findings are studied. Broadly speaking they fall into two large groups. Firstly, a group, not so large, in which there is definite bronchiolitis with the accompaniment of numerous small patches of consolidation which could be felt even in the uncut lung. In its finer degrees this is termed a miliary pneumonia by one writer. Secondly, those cases in which there is a rapidly spreading bronchopneumonic process, often becoming confluent, large areas of the lung consequently becoming involved in the process.

In both groups almost invariably there is hæmorrhagic congestion surrounding the patches and in every case in which an examination was made, there was a more or less general hæmorrhagic congestion of the mucous membrane of the trachea and bronchi. In addition I do not remember one case in which there was not hæmorrhage, petechial or otherwise, in several organs, but most often below the capsule of the liver and under the pleura. These evidences of a highly toxic state probably account for the peculiar lilac tint of many patients. Much discussion has taken place as to its nature. It is not necessarily associated with any direct evidence of circulatory embarrassment, but many of these patients ultimately become cyanosed with the progress of the disease and the onset of cardiac distress.

Of the complications, I purpose referring to two only. The first is nephritis. Although evidence of a mild form is common, in my experience it clears up with the subsidence of the fever and leaves no lasting signs. In the fatal cases, a hæmorrhagic condition of the kidneys is not uncommon.

The second is empyema. This is a common complication and its successful treatment is a source of great anxiety. Many of these patients have done well in even surviving the previous condition and whether treated by drainage or by aspiration, their convalescence is tedious and their stay in hospital long. The empyemata are nearly always streptococcal or pneumococcal in origin and my own impression is that all patients, but especially those with the streptococcal form, do best with repeated aspirations until the fluid becomes thicker, when more adequate drainage is called for. At least, I am convinced that the best surgical thought is called for in the successful treatment of this complication.

Prophylaxis.

The virus of infection normally gains entry through the nose and throat and is present in the secretions from the surface of the respiratory tract. It is known that this virus can be transmitted through the air for a considerable distance to the healthy by the sick in the form of a fine spray during the acts of sneezing, coughing or even talking.

It is therefore evident that close contact helps much in the transmission of the disease and it follows that it is of great importance to avoid overcrowding, this applying particularly to public buildings, conveyances and places of public resort generally. The same rule holds good regarding the dormitories of institutions, such as public schools, where adequate spacing of the beds should receive more than usual attention in the event of an outbreak of influenza.

The general population in their private lives should see to it that all hygienic and dietetic precautions are taken to maintain a high standard of general health and therefore as high a personal resistance as possible to the infection.

Many are the preparations that have been recommended for use as gargles and nasal sprays or douches. I believe nothing but good can result from the use of some simple cleansing lotion with or without an antiseptic. My own preference is for a sterile salt solution or a weak solution of one part of "Glycothymoline" which contains thymol, to four or five parts of water as a nasal douche or spray and gargle. I note that the Ministry of Health in Great Britain is in favour of the use of thymol in solution.

A word of warning is not amiss here. The nasal mucosa, although exposed to hard usage, especially in the dust *et cetera* of cities, is none the less a very delicate membrane, easily damaged by foreign agents, such as chemicals commonly used as antiseptics. A healthy uninjured nasal mucosa is to a large extent our first line of defence and yet in the last great epidemic I found many relatives of my patients using comparatively strong antiseptic

solutions for the nose and throat in their desire to avoid infection. This was quite wrong and I am sure tended to defeat the object in view. The routine use of such things as gauze masks by the general public is in my opinion useless, if not actually harmful, but I believe there is something to be said in favour of the wearing of a light gauze mask damp with a weak thymol solution by nurses and medical men while actually attending to patients in the influenza wards of a hospital.

There was much discussion in 1918 as to the value of vaccine injections, into the theoretical aspect of which I do not propose to enter. Unfortunately the bacteriologists, as mentioned before, have not yet reached finality as to the virus causing influenza and until this is done, we cannot expect to have any specific means for its prevention or cure. But I am one of those who from a practical point of view was very favourably impressed with the value of the mixed vaccine provided by the Commonwealth Serum Laboratory.

Although perhaps it is impossible to prove this scientifically, I had good reasons for thinking that it not only lessened the incidence of the disease, but also its severity.

In December, 1918, I gave the above-mentioned vaccine to nearly six hundred employees of two houses in the city, about two-thirds of the number being given two doses and the remainder three doses at intervals of three to four days. I have mislaid the figures regarding morbidity and mortality, but they were very low, so low that in the following April the general manager of one firm requested me to repeat the series of doses. One of the firms was a large retail house with therefore ample opportunity for personal contact not only between individual employees, but also with their customers. I am inclined to attach more importance to the apparent good result of vaccine treatment in such instances than to figures concerning family patients.

I would finish by emphasizing the importance of the Government or some board authorized by it taking upon itself in the event of any future large outbreak the organization of the nursing service and the provision of assistance to those more needy ones in our midst, many of whom suffered from more than influenza in the last pandemic.

Treatment.

As already mentioned, we have no specific remedy and of necessity the treatment must be on general lines and symptomatic. In all cases rest in bed is essential and I believe in an open-air treatment as nearly as is possible, especially for the pneumonic patients. The diet should be nourishing, though liquid and the drinking of fluid should be encouraged in order to promote elimination of toxins. As is to be expected, numerous are the drugs *et cetera* that have been used and in such a short paper as this it is impossible to do more than even mention a few tried and in some hands apparently found of some use. Vaccine prepared from Pfeiffer's bacillus has been given at the onset in small doses; various sera, but especially antipneumococcal and antistreptococcal have been injected intravenously. "Eusol" has been administered in the same way. Quinine, camphor, oil of cinnamon, gelsemsium, salicin, all orally given, to mention a few drugs, have their champions. I have had no experience of the two last named, but several writers have claimed good results from the use of the tincture of gelsemsium in doses of 1·2 mils (twenty minims) every four hours for the first twenty-four hours, with half doses at the end of this time. Several claim great benefit from the use of salicin in doses of 1·2 grammes (twenty grains) every hour for twelve doses and then every four hours. I think that it can be said that all these preparations have been found wanting and for myself I believe that acetosalicylic acid is easily the most valuable single drug for the relief of the headache and general pains. Usually an expectorant mixture is also required and/or a cough linctus for those patients with a very troublesome cough.

Locally I know of nothing more soothing to the raw soreness of an acute tracheo-bronchitis than repeated light hot linseed poultices with or without an admixture of mustard, applied to the front of the neck and chest. They are far preferable to the more modern messes and pastes that are commonly used and left on till cold.

For the pneumonic patients we still lack a specific means of treatment. From my experience I believe that the use of serum has been beneficial and that it tends to raise the patient's resistance, but it remains for us to treat these patients mostly symptomatically and with close observation and cooperation on the part of the doctor and a skilled nurse. One of our main objects should be to anticipate the onset of unfavourable signs and symptoms and in this connexion I would urge the value of the routine use of the sphygmomanometer, preferably by the auscultatory method. The systolic pressure tends to fall much more than the diastolic and by regular readings it is often possible to get some warning of the need for cardiac stimulants and so on before there is any appreciable change in the pulse rate or volume or in the colour of the patient.

One word of warning is necessary. In at least some cases proceeding to a fatal termination a rise in the systolic pressure occurs, but in the presence of other serious signs such a rise should not mislead the physician. In more recent times the manganese treatment of pneumonia has been tried extensively. The solution commonly used is one containing 0·14 gramme of potassium permanganate in a litre of water. Ninety to three hundred cubic centimetres (three to ten ounces) of this warm solution are run slowly into the rectum every two and a half to four hours, the frequency depending on the duration of the disease at the inception of treatment and on the ability of the patient to retain the solution. Full details can be found in the

literature and such favourable reports have been published regarding its good effects in pneumonic processes that further trial is well justified.

Many patients require little or no active drug treatment, but I believe that, when indicated, alcohol, used with discretion, is a most valuable drug. Strychnine likewise is very beneficial at times and "Pituitrin" in half to one cubic centimetre doses is useful when there is any cyanosis or cardiac dilatation.

The use of digitalis by good physicians in patients without cardiac irregularity is so common that I prefer to keep an open mind concerning its value, although I myself am not impressed by it. Camphor I have ceased to use. I have seen much discomfort caused by injections of this drug and never any benefit.

But so much can be said of the treatment of the pneumonic patient that in the short time at my disposal I propose to limit my further remarks to four points to which I attach great importance.

The first of these is sleep. As a general rule I say that the subject of an acute pneumonic process who does not sleep, dies. In acute cases the ordinary hypnotics, barbitone, bromides *et cetera*, are of no avail and I am a firm believer in the vital importance of giving rest to sleepless, restless, may be delirious, toxic patients. In such cases I give heroin or morphine with atropine, hypodermically, usually at night time, in an attempt to ensure three or four hours sleep. I give 0·015 gramme (quarter of a grain) or 0·02 gramme (one-third of a grain) of morphine or a corresponding dose of heroin and am quite convinced that nothing but good results. Cyanosis, cardiac dilatation and so on in such a patient as I picture, are all the greater indications for such dosage, because without some rest from his mental and physical distress he will almost certainly die.

The second is the use of oxygen. We all believe in its value, but in my opinion it is commonly not used early enough, continuously enough, nor in a proper way. Watchful observation will tell us if a patient is even likely to become cyanosed and its administration should be begun immediately. One should never wait for any degree of cyanosis to develope. Then to this day it is not uncommon to see it administered through a glass funnel held over the mouth for a few minutes at a time. It is very easy to arrange for the gas from the cylinder to pass through water in a bottle, so as to regulate the flow and for that oxygen to be passed through a second glass tube in the stopper and so to an ordinary rubber catheter inserted into the nose of the patient and fixed in position by a piece of strapping. In such way a continuous even flow of oxygen is given with great benefit to the patient and I have yet to meet the patient, cyanosed or not, who will not admit that he felt better and less distressed while having oxygen.

My third is the value of blood letting, either by venesection or by leeching. Here again in selected cases, many of them of the type that I have just been referring to, and even before the onset of any definite cyanosis I believe that the removal of one hundred and eighty to three hundred cubic centimetres (six to ten ounces) of blood is often productive of much good and this can be repeated if occasion arises.

In the fourth place every observant nurse can tell us how much distress is caused, how "knocked out" a pneumonic patient can be sometimes for hours by an enema with its consequent effect. Now it is practically certain that all these patients have had their bowels well opened at the onset of the disease and for that reason I believe the routine use of the enema, say, every second day, is absolutely unnecessary and productive of great harm. In my wards at The Alfred Hospital it is a standing order that no patient with lobar pneumonia after the second or third day of the illness shall have an aperient or enema, unless for exceptional reasons. The conditions under review are bronchopneumonic and therefore apt to run a more protracted course, but with a modification for that reason I believe the rule should hold good.

INFLUENZA: ITS EPIDEMIOLOGY AND PREVENTION.[1]

By FRANK R. KERR, D.S.O., M.D., B.S. (Melb.), D.P.H.,
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THE influenza organism belongs to that group of bacteria transferred by what is known as "droplet infection." Quiet breathing does not detach the germs from the moist surface of the mucous membranes, but coughing, sneezing or talking sends out from the mouth a spray of saliva holding suspended in its droplets organisms from the mouth, nasopharynx or lower respiratory passages. If a susceptible individual comes within range of a source of these infected droplets, he will receive into his mouth and nose a greater or smaller number of them and, according to the dose, may or may not contract the disease.

In our efforts at prevention we must not only increase the resistance of persons exposed, but must attempt to lower the virulence of the organisms by prolonging the time of transfer and increasing the distance travelled between a person infected and a person exposed.

Influenza may also spread by hand-to-mouth infection and to a certain extent by indirect contact.

Influenza is an acute, highly infectious disease, primarily of the upper respiratory passages, but with a tendency to bronchial, pneumonic and other complications and often severe constitutional effects. The incubation period is from one to three days. It is the chief epidemic disease of our race, being epidemic or pandemic rather than purely endemic. Its main characteristic is the irregular occurrence

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 6, 1927.

of grave pandemics, often lasting for years, followed by minor epidemics and sporadic outbreaks.

The disease is always prevalent to a certain degree, especially during the colder months, when complications are more likely to occur and cause deaths. A few scattered infections occur in a community, many susceptible individuals are attacked and the outbreak wanes. An epidemic may originate in several centres simultaneously.

Influenza itself probably is never fatal, the deaths being due almost solely to cardiac and respiratory complications. Why does an epidemic arise? We do not know all the factors concerned, but a rapid rise in prevalence may be due to some hidden influence bringing about increased virulence of the responsible germ or to the gathering together of a population which has outgrown its immunity. There probably is some degree of immunity after an attack, though not in 100% of individuals, which may last a year or so. During the 1918-1919 pandemic second and third attacks were rare. Overcrowding and special reasons for the congregation of a large number of people may assist an epidemic. During the Great War the massing together of so many soldiers in billets, camps, transports and hospitals had no doubt a great influence in rapidly spreading the disease.

During an epidemic from 30% to 40% of the population are usually attacked. Dengue is the only disease which can be compared with it in the large number of individuals attacked during a short period of time. An epidemic in a given locality usually lasts from six to eight weeks. It spreads with great rapidity and is quite independent of ordinary hygiene and sanitation. Both sexes, all ages and all classes are attacked. Owing to the short incubation period, the ease of transfer and the great susceptibility of mankind, we find that an epidemic usually opens with violence, the number of persons attacked rising rapidly to a maximum and then falling. Many people do not think it necessary to go to bed nor even to isolate themselves, but, going about their ordinary business, spread infection rapidly. Because of the large number affected the mortality is high, but the case fatality is low. Usually mild and uncomplicated cases occur at the commencement of a pandemic and as it progresses to the maximum incidence, the virulence increases and then subsides with the waning outbreak. In a pandemic a second wave may follow after six or eight months, but this second wave will not materialize if it falls due during the summer months.

An interesting fact pointed out by Brownlee is that epidemics, more or less severe, tend to recur at intervals of about thirty-three weeks. If an outbreak is expected between the months of June and October in the Northern Hemisphere, however, it becomes ineffective and does not develop until after sixty-six weeks.

Although influenza has a low fatality rate, in view of the large number of people attacked it is a most disabling disease to the life of a community, causing a great number of absences from work and thus considerably disorganizing commercial life.

Bacteriology.

The causal organism is still disputed. In 1892 Pfeiffer discovered the *Bacillus influenzæ*—a weak, Gram-negative organism, found in the bronchial secretions of sufferers from influenza. It grows feebly on blood-agar. It is found in many normal throats and is frequently present in cases of measles and pertussis. Olitsky and Gates a short time ago described an ultra-microscopic virus, which they claimed as the cause of influenza. Pfeiffer's organism may act like the pneumococcus and the *Streptococcus hæmolyticus* as a secondary invader, being responsible for some of the complications.

History of Pandemics.

Many pandemics of influenza have occurred in history, eighty being known to have broken out since 1173. Sydenham described an outbreak in 1510 and since his time fourteen have been authenticated. A record of the dates of these pandemics shows how irregular the sequence is: 1510, 1557, 1580, 1593, 1729, 1732, 1762, 1788, 1830, 1833, 1836, 1847, 1889 and 1918. In England there was a very serious epidemic in 1900. In 1732 Dr. Short described the outbreak as "the most sudden and universally epidemic catarrh that has been in this age, sparing neither ranks, sexes or ages, old or young, weak or strong, and killing off many hectic and phthisical people." Influenza undoubtedly lowers resistance and favours the occurrence of tuberculosis and it is somehow epidemiologically related to *encephalitis lethargica* and to cerebrospinal meningitis.

The 1918-1919 pandemic has been the worst within living memory. There were two hundred million cases and ten million deaths in less than a year. In India five million people succumbed to influenza between June and November, 1918.

Epidemics and pandemics spread just as rapidly as human travel. The 1889 pandemic commenced in Central Asia in May and reached London in December. At the end of the year cases occurred in New York and the disease arrived in South Africa in January, Australia in February. The far East has been responsible for many of the pandemics. Spain was probably the originating centre in 1918.

The 1918-1919 Pandemic.

One of the features of the 1918-1919 pandemic was that the age-period, sixteen to thirty-five years, was the one most heavily affected; in all other epidemics both before and since deaths were most numerous in the fifty-six to seventy-five age-period. Females were more affected than males, but among males the death rate was the greater. Chronic malaria patients and pregnant women took the disease badly.

The outbreak, although extremely serious, was milder in Australia than elsewhere, probably because an efficient system of quarantine postponed the entrance of the disease for a few months. In

1918 in England and Wales the mortality rose to 3,129 per million inhabitants. In the Commonwealth in 1919 there were 11,552 deaths from influenza, representing about 2,180 per million. Since then 1923 has been the worst year, with 1,210 deaths (769 from pneumonia and 441 from other influenzal causes). This is about 220 per million mortality rate. Since 1923 there has been a decline, with only 582 total deaths in 1924 and 351 in 1925. Although influenza was very prevalent in England during 1922 and 1924, very little of the disease reached Australia *viâ* maritime routes.

Recent Outbreak in Europe.

The recent epidemic in Europe began in Switzerland early in December, 1926, and radiated outwards in all directions. By the end of the month it had reached France and Spain and January saw undue prevalence in the South of England, Belgium, Holland, Germany and Denmark. In February the epidemic was evident in the English Midlands, Sweden, Finland, Czecho-Slovakia, Bulgaria and Macedonia and at the end of February it had penetrated to the North of England, Norway, Russia and Yugo-Slavia. Infections occurred also in Japan and Korea in February. In the meantime the epidemic subsided in the countries first attacked, having lasted from six to eight weeks. At present the outbreak has practically ceased in Switzerland, France and Spain, but is still prevalent to some extent in Scotland and Ireland, Russia and the Balkans.

There is no sign yet of a second wave commencing in Switzerland. Throughout the epidemic the disease has been of a mild type, with practically few complications. The very old and the very young have died from it, quite unlike what happened in the extraordinary pandemic of 1918-1919, when the highest death rate occurred among young adults. It is evidently a severe form of the usual type of influenza prevailing every winter and caused by the severity of the season experienced in the north and the hardship occasioned by the coal shortage. As the summer is approaching, it is likely that a secondary wave will not develope.

In England, the country we are most concerned with, because of the number of people travelling backwards and forwards, the disease is not really so serious as the outbreak present there in 1922. If the epidemic should reach Australia, it will probably be of the benign type. It is possible for an outbreak on board ship to have finished its course before the ship reaches these shores. Week by week the number of deaths from influenza in the one hundred and five large towns of England have been as follow:

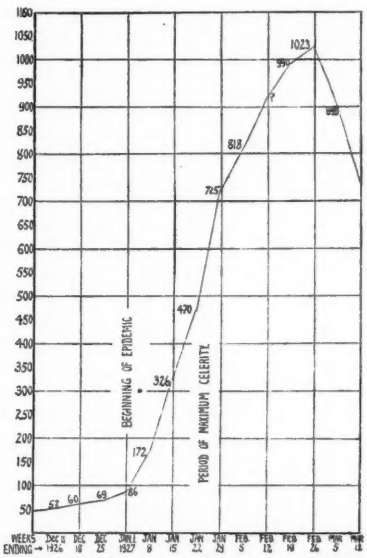
For the week ending December 11, 1926, 52 deaths.
For the week ending December 18, 1926, 60 deaths.
For the week ending December 25, 1926, 69 deaths.
For the week ending January 1, 1927, 86 deaths.
For the week ending January 8, 1927, 172 deaths.
For the week ending January 15, 1927, 326 deaths.
For the week ending January 22, 1927, 470 deaths.
For the week ending January 29, 1927, 725 deaths.
For the week ending February 5, 1927, 818 deaths.
For the week ending February 12, 1927, ? deaths.
For the week ending February 19, 1927, 990 deaths.
For the week ending February 26, 1927, 1,023 deaths.
For the week ending March 4, 1927, 893 deaths.

The figures are shown in the accompanying graph.

An interesting fact, pointed out by Dr. Cumpston, is that the number of vessels infected with influenza, leaving a country where an epidemic is raging, reaches a maximum and begins to fall, before the land epidemic has even reached its maximum. At present the European outbreak has actually passed its maximum (the first wave, at least) and only one or two ships have reached Australia with influenza patients on board. As in previous epidemics, careful watch is being kept for any increase in the severity of symptoms, any rise in the fatality rate, any greater prevalence of complications and any undue prevalence of deaths among young adults. So far none of these points have been in evidence.

Prevention.

With regard to Australia, an efficient system of quarantine is first of all essential. The Commonwealth Department of Health receives regular information by cable from the Health Committee of the League of Nations at Geneva, *viâ* Singapore, the base and distributing centre for the Far Eastern Area, including the Pacific. From Melbourne the facts regarding the epidemic are relayed to the Chief Quarantine Officers in the States, the State Health Departments, the Mandated Territories and the British High Commissioner for the Pacific who is stationed in the Solomon Islands.



Graph Showing Deaths from Influenza in One Hundred and Five Large English Towns.

Procedure of Quarantine.

A healthy ship, arriving at an Australian port, is given pratique at once. If there were a mild epidemic of influenza on board, which was definitely subsiding, the ship would be given limited pratique and inspected at each port. There would be no actual quarantine and patients would be isolated

at home or in hospital. If the epidemic on board were on the up-grade or if death or serious complications had occurred, the vessel would go into quarantine at the port of entry and proceed in quarantine to the next port. All patients would be isolated at home or in hospitals. Passengers would go into quarantine at their port of disembarkation for seven days and disinfection would be carried out. The vessel would be inspected at each port and at the terminal port complete disinfection of the vessel with formalin would be carried out.

Preventive Measures.

The chief measure in prevention is isolation of the patient. The public should be instructed that bed is the best place when symptoms occur during an epidemic. At any rate patients should remain at home in isolation. We do not know the true relationship between influenza and ordinary "common colds," "influenza colds," "grippe" *et cetera*, so that it is better to treat all of these seriously during an epidemic. Personal hygiene will accomplish much. Nasal douching, insistence on good ventilation and sunlight and avoidance of crowds during an epidemic all help. People should realize the danger of coughing and sneezing in proximity to another person's face. In an office or workroom, if all employees were made to face the same way, instead of sitting opposite one another at tables or benches, chances of infection would be lessened.

Closure of schools, theatres, cinemas *et cetera* does not seem to do much good, neither does the wearing of masks. An inhalatorium has been tried with doubtful success. Prophylactic vaccines proved a failure during the last pandemic and, as we do not know the causal organisms, there is no scientific basis for their use.

There should be adequate hospital accommodation for seriously affected persons, by making certain of the possession of emergency hospitals and a plentiful supply of nurses. In fact, the whole of the medical, nursing and social services in a community should be organized in readiness for the arrival of an epidemic at any time.

PATHOLOGY AND CLINICAL FEATURES OF INFLUENZA.[1]

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In preparing this short paper I have used exclusively records of patients who were treated in the Melbourne Hospital during the epidemic of 1919 and the account of the pathological findings has been culled from the same source. Statistics have been omitted purposely, as also have references to the epidemic as it occurred elsewhere. In its main features the disease in Australia closely resembled the type seen in other countries, so that these omissions will not greatly matter.

In December, 1918, and January, 1919, cases of influenza began to occur, at first few in number, but later with rapidly increasing frequency. These infections differed very little from those previously seen, although in some instances there was rather more associated asthenia. Headache and backache were intense. Epistaxis was occasionally seen and in January a few patients were seen who exhibited basal pulmonary signs. At that stage there was nothing very alarming about either the number of cases or their severity. Towards the end of January, however, a patient with pneumonia was admitted to the hospital. She was desperately ill, exhibited an unusual type of cyanosis of the lips, almost heliotrope in colour, which was rendered more startling because of the ashen pallor of the rest of the face. Within a few hours the patient was unconscious and delirious and death soon occurred. The outstanding points about this patient's condition were the peculiar cyanosis, the extraordinary virulence of the infection and the atypical lung signs. Dr. Grantley Morgan performed the autopsy and found a condition similar to what had been reported by pathologists in England and America. It was at once realized that pneumonic influenza was prevalent and it was not more than a week or two before the first wave of the epidemic was approaching its highest point.

Pathological Findings.

The *post mortem* findings were on the whole very similar in all the bodies examined. The outstanding changes appeared of course in the respiratory system. There were constantly present acute inflammatory changes in the bronchial tubes with intense engorgement and submucous hæmorrhages. These signs became more intense in the smaller bronchial tubes and bronchioles, where the mucous membrane was uniformly red in colour with definite submucous hæmorrhages. The bronchi usually contained bloodstained frothy fluid. In the lung parenchyma the most pronounced changes occurred in the lower lobes and in the vast majority the whole of these lobes was affected in varying degrees. The most advanced changes were found as a rule along the vertebral and diaphragmatic borders of the lobe. Subpleural hæmorrhages were constantly seen together with evidences of dry pleurisy. Pleuritic effusion was uncommon and empyema was seen only on one or two occasions. The lungs manifested always wide involvement of the lower lobes and in many cases the whole of both lungs with the exception of apices and anterior margins were affected. On section the lungs were seen to contain large areas, dark red in colour with definite hæmorrhagic patches. Some of these patches closely resembled hæmorrhagic infarctions in appearance, but no actual blockage of the supplying vessel could be demonstrated. The most involved areas were completely solid and sank in water, but the greater portion of the lung was incompletely solid

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 6, 1927.

and would float in water. The cut section was very wet, dripping blood-stained fluid in large quantities.

The heart muscle usually manifested considerable degrees of toxic spoiling, as did also the liver, spleen, suprarenal glands and kidneys. Pericarditis, pancreatitis, meningitis, gross hæmorrhage into the suprarenal gland, empyema, hæmorrhage into the wall of the duodenum were complications noticed *post mortem*. On the whole, however, apart from toxic spoiling, definite lesions in other organs were rarely seen.

Clinical Points.

Age Incidence.

No age was exempt, but the great majority attacked were adolescents and young adults. Two striking facts throughout the epidemic were first the comparative rarity with which those over the age of fifty were attacked, and the success with which many of these resisted the disease, and, secondly, the tendency for the most virulent form of the disease to attack young, previously strong and healthy adults with rapidly fatal results. The two sexes were attacked with equal frequency.

Mode of Onset and Symptoms.

The onset was usually fairly abrupt and within twenty-four hours patients as a rule had to go to bed. In a minority the onset was sudden, the first sign being the occurrence of a definite rigor. In a certain number the onset was gradual, malaise being present for several days before patients had to take to bed. The symptoms most frequently complained of were headache, backache, generalized pains, vomiting, shivering and sweating and asthenia. The headache in nearly all cases was severe in degree, mainly frontal and associated with burning pain in the eyes. Backache was frequently most intense, situated in the small of the back and was quite often the chief symptom. Associated with the headache and backache was a feeling of considerable general weakness. Shivering and sweating were usual accompaniments. In most instances shivering was slight and transient, but definite rigors were not uncommon and sometimes these were repeated for several days. Vomiting was a very constant symptom, sometimes limited to the period of onset, sometimes persistent throughout the whole illness. Diarrhœa was occasionally present, but constipation was more usual. Even in patients with few or no pulmonary signs there was a definite tendency to cyanosis, although of course this was not nearly so pronounced or so constant as in the definitely pneumonic type. Epistaxis was present in a minority of the cases and occasional instances were noted in which it was severe and repeated. Herpes was infrequently seen. The sputum was in the great majority of cases blood-stained at some stage. In the pneumonic forms of the disease brisk hæmoptysis was not uncommon. In the milder cases the sputum was partly mucoid or muco-purulent with only small amounts of blood. Rusty sputum was reported in a few cases, but in those which were examined *post mortem* the appearances were much more typical of true lobar pneumonia. Symptoms of acute inflammation of the nasal mucosa and accessory sinuses were scarcely ever pronounced. Sore throat was a frequent complaint and was accompanied by a congested and slightly swollen condition of tonsils, fauces and pharynx. The onset of pneumonia was sometimes very rapid, sometimes gradual. In the most virulent type the patient was dangerously ill within a few hours and death occurred in some of these in from eighteen to thirty-six hours from the onset of the illness. In some instances the patient would appear for two or three days to be suffering from influenza with no evidences of danger and then suddenly within a few hours would be obviously dying with intense cyanosis, unconsciousness and delirium. In others the pneumonia gradually appeared, the patient becoming cyanosed by degrees over several days, lung signs slowly increasing, until eventually rapid respiration, intense cyanosis and delirium appeared. The first signs of danger were the appearance of cyanosis, quickening of respirations and pulse, together with gradually developing stupor and eventually complete unconsciousness with delirium. Cyanosis was one of the most constant and most prominent signs present in the pneumonic cases. Even when the presence of actual pneumonia was open to question, on account of the absence of definite pulmonary signs, there was frequently apparent a slight cyanosis of lips and ears. In the frankly pneumonic cases the cyanosis was constantly present and frequently extreme, much more so than is seen in lobar pneumonia. The cyanosis was of two general types, depending on the physical type of the patient. The full blooded plethoric individual developed a general cyanosis of the whole body, most obvious in the lips and face and in the dependent parts of the body, notably the flanks, buttocks and back. In this it followed closely the distribution of *post mortem* staining and when it appeared, was always a sure portent that death was close at hand. This cyanosis did not differ in any way from cyanosis usually caused by deficient oxygen, as seen in cases of obstructed breathing during anæsthesia. The other type of cyanosis was seen most frequently in the pale type of individual and appeared sometimes as a heliotrope discoloration of the lips, sometimes as a bluish-purple discoloration which was rendered more startling on account of the ashen pallor of the cheeks. The colour was so unusual that it was thought to be due possibly to some abnormal pigment in the blood. However, spectroscopic investigation failed to reveal the presence of any such. *Post mortem* examination revealed in these cases almost universal involvement of both lungs, bronchial tubes, bronchioles and lung parenchyma suffering equally. In addition there was very considerable spoiling of myocardium and in several cases of the suprarenal glands to the extent of almost complete destruction of the medulla. In view of these findings it is probable that the cyanosis was due to a combination of all three factors.

This cyanosis did not as a rule appear suddenly. It was present to some extent from the onset of the illness, but in many cases it changed in the course of a few hours from the mildest degree to the most intense. We regarded intense cyanosis as a very grave sign and in practically every case death followed its appearance within twelve to thirty-six hours. In the milder or what might be called half way cases between influenza and true pneumonic influenza, the physical signs were limited to the lower lobes and consisted of slight degrees of dulness with diminished heart sounds and crepitations. In the true pneumonic cases the dulness was very definite and involved a considerable area of both lungs, being most pronounced in the basal regions. In a number of cases the whole of both lungs was involved with the exception of the extreme apices and anterior margins. The breath sounds were usually definitely diminished and of bronchovesicular type with numerous crepitations and in the later stages râles and rhonchi were frequent. In a minority of the cases areas of tubular breathing were noticed, but these areas were usually small and did not cover whole lobes as in lobar pneumonia. Some of the case histories record large areas of tubular breathing, but in most of these the *post mortem* appearances were much more suggestive of lobar pneumonia. The *post mortem* appearances in the pneumonic influenza cases corresponded very well with these physical signs. There was intense bronchitis, the smaller tubes contained a great deal of frothy fluid, completely solid areas of lung were comparatively small and the greater portion of both lungs was to a varying extent air-containing. Gross degrees of pleurisy were infrequent as were naturally also coarse friction sounds

Complications.

Complications were uncommon. In addition to empyema pancreatitis was seen in one or two cases and in one instance early meningitis of the vertex which had not been detected clinically, was found. Endocarditis was not seen, nor was peritonitis. Pericarditis was only an occasional complication. Several patients developed bronchiectasis as a sequela with typical expectoration and pulmonary signs. *Otitis media* was very rare and arthritis did not occur. Some months after the epidemic one or two patients with diabetes were seen who dated their symptoms from an attack of influenza accompanied by persistent upper abdominal pain; the influenza had presumably been complicated by pancreatitis. Cases of asthma have also been seen in which the symptoms apparently dated from an attack of influenza.

Prognosis.

In the influenzal patients with few pulmonary signs prognosis was good and I cannot recollect any such patients who did not recover. Even in the presence of widespread pulmonary involvement recovery not infrequently occurred, although on the whole the more widespread the lung involvement, the more serious was the prognosis. Those patients who developed marked cyanosis, did not recover. Rapid respirations, delirium and stupor were signs of very grave import. The toxæmia in these instances was overwhelming and death occurred quickly in several cases in from eighteen to thirty-six hours from the onset of the illness. Pregnancy was a very unfavourable accompaniment of pneumonic influenza and death usually occurred in a few days without spontaneous abortion. Youth and previous good health did not protect and a large proportion of the deaths occurred in previous healthy young adults.

The patients with severe pneumonic forms of influenza were admitted on the whole sooner after onset than those with the non-pneumonic form of the disease, so that the factor of delay did not influence the result. Further, the great majority of the patients were compelled to take to bed very soon after the commencement of the illness and only a few gave a history of having attempted to continue at work for several days. It seemed to us that in most cases the infection was an extremely virulent one from the outset. Treatment appeared to have but little effect and these patients with virulent infections almost without exception succumbed.

Reports of Cases.

PEANUT IMPACTED IN THE RIGHT BRONCHUS.

By J. M. BAXTER, M.D. (Melbourne),
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AND

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CLINICAL HISTORY.

(J. M. BAXTER.)

ABOUT July 1, 1926, A.B., aged four and a half years, whilst eating peanuts was seized with a violet spasm of coughing which nearly choked him. The coughing continued for some hours and then abated somewhat, but did not completely disappear. The child was seen some days later; but at that time no history could be elicited suggestive of inhalation of a foreign body. Chest examination revealed definite loss of vesicular murmur over the whole of the right lung anteriorly and posteriorly, such loss compared with the left lung being estimated in ratio of 1 to 4. Râles and rhonchi were present over both lungs and a continual brassy cough was present. A diagnosis of a foreign body was made. An X ray picture was taken, but no opaque foreign body was found. The child was kept under observation for a time during which the chest sounds varied in intensity and at times almost disappeared. The temperature frequently reached 40° C. (104° F.) and respiration reached 70 per minute, together with great respiratory embarrassment. Night sweats were common. Operation was advised, but deferred for the time. Further films were taken at this stage which were confirmatory of a non-opaque foreign body. About September 1, 1926, the child was steadily getting worse and the odour of the breath was very offensive. Operation was decided on. While arrangements were being made

ILLUSTRATIONS TO THE ARTICLE BY DR. J. M. BAXTER AND DR. COLIN MACDONALD.

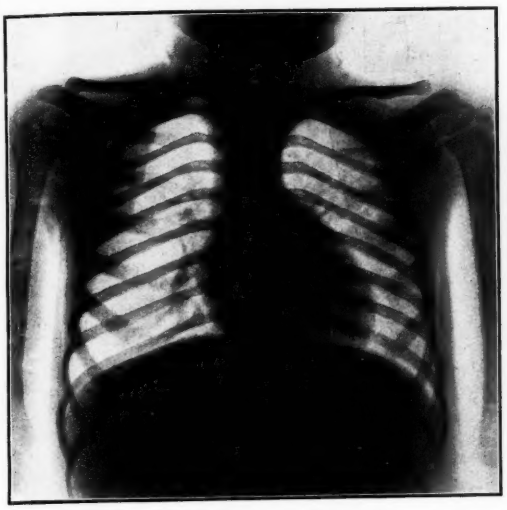

FIGURE I.
Showing Appearances Before Removal of the Foreign Body, Chest at Full Inspiration.

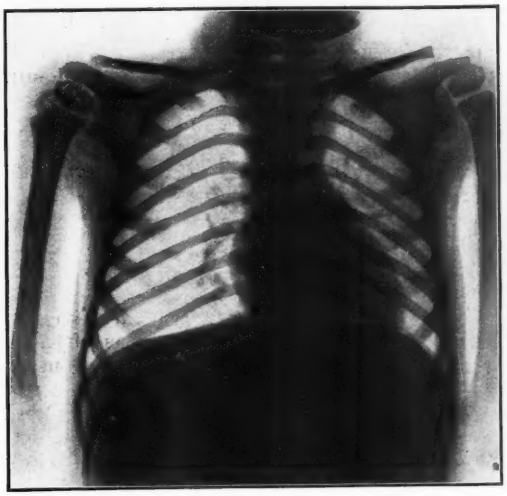

FIGURE II.
Showing Appearances Before Removal of Foreign Body, Chest at Full Expiration. Note the relative increased translucency of the right lung field, the mediastinum displaced to the left and flattening of the right diaphragmatic dome.

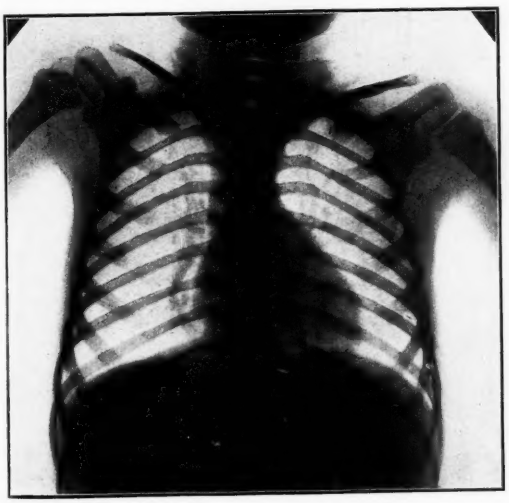

FIGURE III.
Showing Appearances After Removal of the Foreign Body, Chest at Full Inspiration.

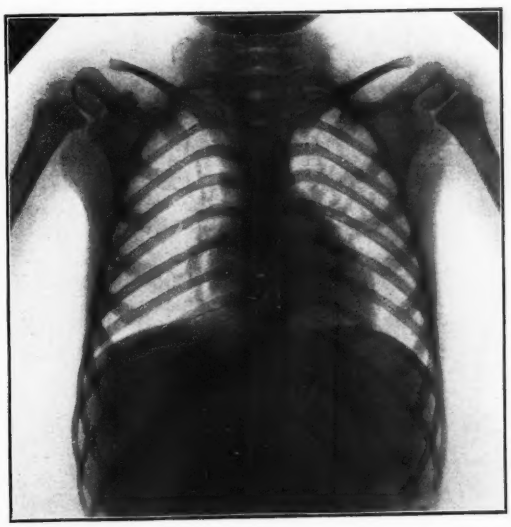

FIGURE IV.
Showing Appearances After Removal of the Foreign Body, Chest at Full Expiration. Note that the abnormal signs seen in Figure II have now disappeared.

ILLUSTRATIONS TO THE ARTICLE BY DR. ALAN PRYDE AND DR. W. P. HOLMAN.

FIGURE I.

FIGURE II.

ILLUSTRATION TO ARTICLE BY DR. R. J. WRIGHT-SMITH.

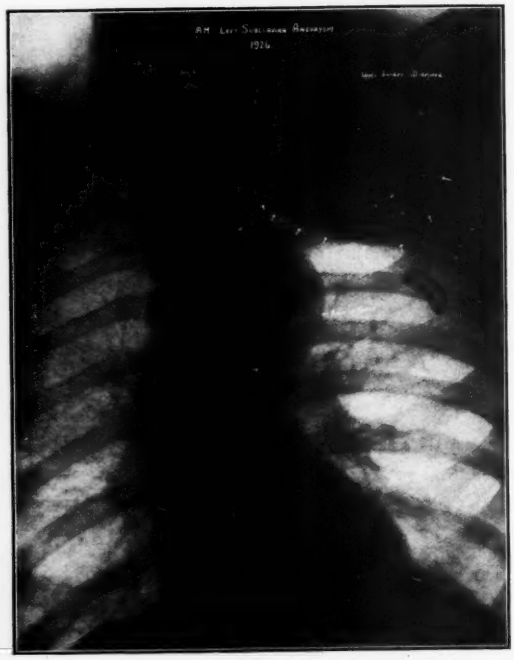

Figure Showing Radiological Appearance of Subclavian Aneurysm.

ILLUSTRATION TO ARTICLE BY DR. A. T. NISBET.

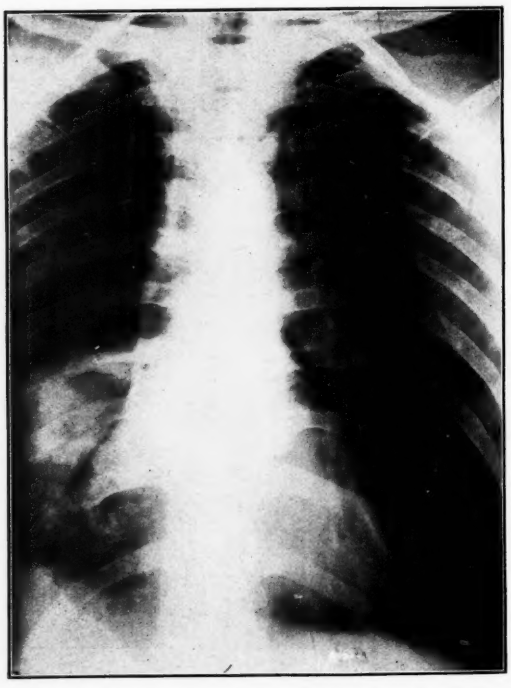

Figure Showing Acute Pulmonary Tuberculosis in Base of Right Lung.

for a hospital, the child developed whooping cough, thus further complicating matters. It was decided to postpone operation till the worst of the whooping cough had disappeared.

Operation.

On December 1, 1926, under general anæsthesia a high tracheotomy was performed and a Haslinger's bronchoscope was used (6·5 millimetre tube). A foreign body which was found to be a peanut, was removed from the right bronchus about 3·75 centimetres (one and a half inches) below the bifurcation. Further examination failed to reveal other pieces. A tracheotomy tube was left in for twenty-four hours, then removed. A day later a very small fragment was expelled through the wound.

Subsequent History.

The child made an uninterrupted recovery. The wound closed on the ninth day. The cough disappeared. The child left hospital on the twelfth day.

Comments.

The following call for emphasis:

(i) The great help of the X ray films in diagnosing a non-opaque foreign body.

(ii) The presence of whooping cough when operation was decided upon. Should I have waited for the whooping cough to disappear?

(iii) The immediate improvement in the child's breathing on removal of the foreign body.

(iv) The immediate return of the vesicular murmur to almost normal, the ratio being as 7 to 8.

(v) Twelve days after the operation the child was perfectly well and the X ray films revealed a normal thorax.

Acknowledgments.

My thanks are extended to Dr. R. V. Hennessy and Dr. Colin Macdonald for their valued assistance and to Dr. Davies who administered the anæsthetic in a difficult case.

X RAY FINDINGS.

(COLIN MACDONALD.)

The difficulty of X ray diagnosis of a foreign body in the air passages is dependent on the radiopacity and on the size of the foreign body and on the age of the patient. Dr. Baxter's case combined the features of being a small and a non-opaque foreign body lodged in the lower air passages of a little boy of four and a half years.

At the first X ray examination no shadow characteristic of an opaque foreign body was demonstrated, neither was there any evidence of pulmonary pathological change, for example, enlarged mediastinal glands or pulmonary abscess. During this examination the films were exposed during only one phase of respiration, namely, full inspiration.

The second examination was made with the object of demonstrating radiological evidence of a non-opaque foreign body. The evidence obtained was wholly indirect, namely: (i) Limitation of respiratory excursion of the right diaphragmatic dome, (ii) flattening of this dome on full expiration, (iii) expiratory mediastinal excursion to the left side, (iv) relative increase of translucency of the whole of the right lung field compared with the left during expiration.

These signs were interpreted as being suggestive of an acute, unilateral, obstructive, expiratory emphysema.

A consideration of the mechanics of the condition, the most important factor of which is the physiological expiratory contraction of the bronchi, led to the diagnosis of a non-opaque foreign body in the right main bronchus lying between its first division and the tracheal bifurcation and producing only expiratory obstruction. No lung changes such as atelectasis or pulmonary infection appeared to have supervened. That the foreign body lay in a bronchus and not in the trachea was indicated by the unilateral distribution of the signs; that it lay in a main bronchus before its first division was indicated by the fact that the whole of the right lung field shared in the relative increased translucency on expiration (see Figures I and II).

The films obtained after removal of the peanut showed that the foregoing signs had disappeared and that the thoracic contents both at inspiration and at expiration were normal in all respects (see Figures III and IV).

The technique employed in demonstrating these radiological signs was both radioscopic and radiographic. Films were exposed at both full inspiration and expiration and rapidly so that each phase was caught without movement. At each exposure the tube, the child and the film were accurately and symmetrically centred in relation to one another in order to obviate the errors of mediastinal or diaphragmatic displacement or variation in the translucency of the lung fields due to postural asymmetry.

The case illustrates the teaching of Chevalier Jackson, of Philadelphia, and his radiologist, Willis F. Manges, that whilst in the diagnosis of opaque foreign bodies the lung shadows are of little importance, in non-opaque foreign bodies the diagnosis depends on the interpretation of the shadows of every portion of each lung field, as well as those of the mediastinum and the diaphragm.

PERTHES'S DISEASE.[1]

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AND

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PERTHES'S disease is still considered sufficiently rare to merit reporting the coincidence of two cases seen in one week. As far as we knew at the time, these were the first two recognized as such and reported from Tasmania. However, we have received notes on a third, an abstract of which we include below.

Naturally enough in the past medical men have regarded this condition as an example of tuberculosis of the hip joint and must have been surprised and delighted at the response to their treatment.

CASE I.—A boy, aged nine years, was seen in the Outdoor Department of the Launceston Hospital. He was brought in by his mother whose chief worry was "a lump" in his thigh and a limp. The following history was obtained. Nine months previously the boy fell into a rather deep hole, apparently a severe fall, necessitating confinement to bed for a week. He has walked with a limp ever since. The lump was noticed three months ago. The pain has been present ever since the injury. Previous history was unimportant. The family history was good, nine brothers and sisters were all well. No history of tuberculous infection was obtainable. Examination revealed that the general nutrition was good. General examination, including the teeth, tonsils *et cetera* disclosed no abnormality.

Examination of the right lower limb revealed a slight but obvious limp. The "lump" appears to be the greater trochanter which is much more prominent than that of the left side. There is a slight but general wasting of the whole limb, with a slight shallowing of the corresponding gluteal fold.

Shortening of the right limb relative to left limb of less than 1·25 centimetres (half an inch) is present.

Flexion and extension are not limited. Abduction is grossly limited, while internal and external rotation are relatively affected.

Nothing abnormal is detected in the left lower limb. No reaction occurred to the von Pirquet test with both human and bovine tuberculin.

According to the X ray report the epiphysis is small and flattened and shows areas of osteoporosis alternating

[1] The first patient described herein was shown at a meeting of the Northern Division of the Tasmanian Branch of the British Medical Association on October 2, 1926.

with densely sclerotic patches which together give an appearance of progressive fragmentation. The epiphyseal line is ragged and irregular. There appears to be some widening of the joint space, together with some loss of detail in the outline of the acetabulum. The neck of the femur is greatly shortened and broadened. The appearance is that of Perthes's disease in the first or active stage (see Figure I).

CASE II is that of a boy, aged eight years. He has been limping for the past two years since a fall over a log. Two years ago his condition was provisionally diagnosed as tuberculosis of the hip joint, both clinically and radiologically. He was treated as suffering from this disease since then at first on a double and later on a single Thomas splint, but he was controlled with great difficulty for temperamental and geographical reasons. Nevertheless, he made very satisfactory progress and was sent here for a radiological opinion as to whether his condition could be regarded as healed.

According to the X ray report the epiphysis of the right femur is narrowed and appears to be displaced along the shortened and thickened neck of the femur towards the greater trochanter. It is evenly dense in texture. There is some irregularity of the epiphyseal line and some apparent widening of the joint space is present.

The appearance is that of Perthes's disease in the stage of repair (see Figure II).

CASE III.—The third case is that of a girl, aged seven years, when first seen in 1920. Again there is the story of injury one year before with persisting lameness, but characteristically enough very few physical signs were present and these were not pronounced. With the aid of the X rays clinicians in another State made a diagnosis of tuberculosis of the hip. The further progress of this patient who was treated on a double Thomas splint for about two years, was strikingly good and another radiogram taken about two years after the first made clear the correct diagnosis—Perthes's disease.

Conclusions.

It seems to us that three points are brought out rather clearly by these cases and we would draw attention to them by asking and attempting to answer three questions.

1. Is Perthes's disease as rare as is often supposed? It is very suggestive that two cases should be seen in a week in a community not remarkable for its numbers.

2. Can we recognize the condition without X rays? The following clinical criteria, while individually not diagnostic, taken together seem to make a fairly definite clinical picture. (*a*) The history of trauma. (*b*) The length of the history compared with the minimum of physical findings. (*c*) The strikingly limited limitation of movement, more particularly the affection of abduction and rotation, while flexion and extension are free.[1] (*d*) The absence of response to the von Pirquet test. (*e*) Less striking, but apparently characteristic, is the minimum of pain on movement.

3. Is the differential diagnosis from tuberculosis of only academic interest? Cases II and III furnish a striking answer to this question. The prognosis in Perthes's disease[2] [3] [4] is universally acknowledged to be good for a return to fairly complete function in the hip after a course of two to four years, moreover this course seems to be singularly uninfluenced by the institution or complete lack of any form of treatment, simple or severe.

In the face of this it becomes a tragedy to order unnecessarily the prolonged monotony of two or more years' imprisonment in splints.

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[2] G. Perthes and G. Welsch: "*Ueber Entwicklung und Endausgänge der Osteochrondritis Deformans des Hüftgelenkes (Calvé-Legg-Perthes), sowie über das Verhältnis der Krankheit zur Arthritis Deformans*," *Beiträge zur Klinische Chirurgie*, 1922, *Band* CXXVII, *Seite* 477 (abstracted in *The American Journal of Roentgenology and Radium Therapy*, June, 1926, page 566).

[3] F. H. Albee: "Orthopedic and Reconstruction Surgery, Industrial and Civilian," 1919, page 462.

[4] Royal Whitman: "Orthopedic Surgery," Sixth Edition, page 388.

LEFT SUBCLAVIAN ANEURYSM: INTRATHORACIC LIGATURE.

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Clinical History.

A.M., aged forty-seven years, labourer, was admitted to Melbourne Hospital complaining of pain in and wasting of left arm and swelling above and below the left clavicle. Inquiry into his past history showed that he had injured his left shoulder and left supraclavicular region in 1902 and 1911. He contracted syphilis in 1900 and gonorrhœa in 1909. He was a heavy alcohol drinker. His present complaint commenced six years ago when he first noticed a small swelling about 1·25 centimetres (half an inch) in diameter above the centre of the left clavicle. It was pulsatile. Pain was present over the site of the swelling. The swelling had increased in size slowly, the clavicular pain becoming worse and in addition shooting pains in the left arm, forearm and hand had occurred. The left arm, forearm and hand to lesser extent were wasted and pain and numbness became more pronounced. Some huskiness of voice was present and the patient complained that the left side of the face did not sweat.

On examination in the left supra- and infraclavicular region a rounded soft swelling was found. It pulsated synchronously with the apex beat and was expansile. It was situated about 3·75 centimetres (one and a half inches) above and 1·8 centimetres (threequarters of an inch) below the middle and outer thirds of the left clavicle. The clavicle was bowed forwards over the swelling. No bruits were present, but slight diastolic shock. The swelling diminished in size on digital pressure. All muscles of the left arm, forearm and hand were wasted except the brachio-radialis. Wasting was most pronounced in the thenar, hypothenar and dorsal interossei muscles. Clubbing of fingers of the left hand was present. Power in the left upper limb was diminished. Reflexes were absent and all forms of sensation were impaired. The systolic blood pressure in the left arm was 120 millimetres of mercury, the diastolic was 78 millimetres. On the right side the readings were 140 and 115 millimetres. The left radial pulse was weaker than the right and slightly retarded. The heart was somewhat enlarged. There was some dulness over the upper lobe of the left lung with diminished breath sounds and diminished vocal fremitus and vocal resonance. There was definite involvement of the left cervical sympathetic amounting to paralysis as shown by miosis of the left pupil, pseudoptosis of the left upper eyelid, some exophthalmos and anhidrosis of the left side of the face and neck after stimulations. Laryngeal examination revealed some weakness of abduction of the left vocal cord, adduction was normal. The fundi presented sclerosed arteries and venous pulsation, but were otherwise normal. The mental condition varied, at times it was good, at other times the patient was very resistive and suffered from syphilophobia. Radiological examination revealed enlargement of the heart to the left, dilatation of the aortic arch and a large globular shadow obscuring the left apical region. This was apparently not connected with the aortic arch and extended upwards into the neck and downwards to the fourth rib posteriorly. The accompanying illustration shows the radiological appearances. The response to the Wassermann test was "+++."

After consultation it was decided to operate using Henry's method of posterior approach to the first part of the left subclavian artery.[1]

The Operation.

Ether was given by the intratracheal method, the patient lying on his face with the left arm hanging downwards and with a sand bag under his chest. Mr. Hailes made a curved incision, starting about the sixth cervical vertebra and passing outwards over the vertebral border of the scapula and turning in towards the spine about the sixth dorsal vertebra. The skin, subcutaneous tissue and trapezius muscle were divided. The collateral circulation was well marked. The rhomboid muscle was divided. The *serratus posterior superior* muscle was divided. The second and third ribs from the tubercle, 7·5 centimetres (three inches) in a lateral direction, were resected. The cupola of the pleura and aneurysm were pushed laterally and the arch of aorta and origin of the subclavian artery were defined. The origin of the subclavian artery was about twice the normal size and atheromatous plaques were felt in the vessel. It was tied with Number 5 silk and the wound was closed in layers. After ligation of the vessel the aneurysm pulsated very feebly, no radial pulsation was felt for some hours, but the limb was not very cold and apparently received fairly good blood supply. Three hours later the aneurysm began to pulsate well. The limb was wrapped in cotton wool. The radial pulse returned next day and circulation in the arm was good. Systolic blood pressure on the left side fell to 105 millimetres of mercury. The blood pressure remained at this level on the left side. The wound healed well and the patient's mental condition was much improved; there was no pain in the arm. The aneurysm was definitely smaller, though it continued to pulsate.

Four weeks after the operation the first part of the axillary artery was tied under local anæsthesia. The radial pulse was absent for seven days. The patient says that his arm felt much better, no pain was present and the movements were good. The aneurysm continued to pulsate, but was definitely smaller. Antispecific treatment was given and the patient was discharged. Unfortunately all efforts to trace him have been of no avail.

Acknowledgment.

I am indebted to Mr. W. Allan Hailes for permission to publish particulars of this case.

Reference.

(1) Arnold K. Henry: "A Method of Ligaturing the First Stage of the Left Subclavian Artery from Behind," *The British Journal of Surgery*, January, 1923, page 367.

ACUTE PULMONARY TUBERCULOSIS IN BASE OF RIGHT LUNG.

By A. T. NISBET, M.B., Ch.M., D.P.H.,

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IN order to bring the attention of the clinician again to this point, I am reporting a case of an acute pulmonary tuberculosis arising in the base of the right lung and confined thereto.

In THE MEDICAL JOURNAL OF AUSTRALIA of June 25, 1921, the following remarks of mine appear: "In examining these (pulmonary tuberculosis) patients one is struck by the fact that the base of the right lung is an area where early infection takes place. I am beginning to wonder whether the old teaching of the apices being infected first will not have to be revised in the great majority of cases."

What I have seen in the last six years leads me to believe that the clinician's view that tuberculosis almost always commences in the apices of the lungs, is due to the fact that the sounds heard through the stethoscope can be more easily detected at the top of the chest on account of the lung being narrower there than anywhere else and that when infection occurs at a greater depth than two and a half centimetres (one inch) from the chest wall, he hears no sounds until they become so loud as to show that the disease has advanced to an almost incurable stage.

I must thank Dr. D. P. O'Brien, of Rockhampton, for the following clinical notes of this case.

R.A., aged forty-five years, was admitted on October 16, 1926, complaining of shortwindedness on slight exertion, cough and expectoration. He gave a long history of gold mining and his sputum contained tubercle bacilli. The chest was somewhat distended and its movement was diminished. A few clicks were audible over the right clavicle, good air entry occurred over the chest except at the right base. Below a line drawn between the lower angle of scapula and the post axillary fold there was no air entry. This area was dull on percussion, no tactile fremitus was present. From there up to a line with the nipple râles, crepitations and pleural friction were heard. The first area was covered with pleural thickening. Dr. O'Brien looked on pleural fixation of the base of the lung with effusion as extremely serious and difficult to deal with. On January 10, 1927, clicks above right clavicle were absent, sputum amounted to thirty cubic centimetres (one ounce) which was greatly reduced.

I think the accompanying radiogram taken on January 5, 1927, explains itself.

Reviews.

GUY PATIN.

FRANCIS PACKARD, well known as editor of *Annals of Medical History* and author of "The Life and Times of Ambroise Paré," presents an interesting and painstaking study of Guy Patin, one of the leaders of the medical profession of Paris in the seventeenth century.[1]

Born in 1601, Guy Patin's seventy-one years of life corresponded with the reigns of three French sovereigns, Henri Quatre, Louise Treize and Louis Quatorze. He was thus a contemporary of William Harvey, Sir Thomas Browne and Thomas Sydenham in England.

For forty years, 1630 to 1672, he wrote many letters to friends, chiefly brother physicians—letters not intended for publication for they are full of gossip, slander and libellous attacks on professional rivals and enemies. He was in many ways a seventeenth century "gentleman with a duster." Their value is enhanced by the intimate and candid opinions he expresses.

He was a good hater at a time when hate, public, religious and private, was the rule. The two great ministers of France, Cardinal Richelieu under Louis XIII and Cardinal Mazarin under Louis XV, were special objects of his hate, but most of all he hated the Jesuits and by a process of transference Jesuits' bark (quinine).

Opium he also opposed, but was especially bitter against antimony which was then in tremendous vogue.

His distrust of the chemists and apothecaries led him to very simplified treatment. Renaudot, founder of the first French newspaper, attempted to establish a medical school which brought him under the displeasure of the Faculty of Medicine and started a bitter controversy between the two. Renaudot nicknamed him Doctor Three S's—bleeding (*la saignée*), syrup of roses and senna. His practice was not unlike the famous Lettsom of Guy's Hospital, London, with his "I physics, bleeds and sweats 'em, and if they chance to die what's that to me. I lets 'em," with the exception perhaps that the order of events preferred by Patin was following the well known chorus in Molière—"Give an enema, afterwards bleed and then purge." No age from four months to eighty years and no disease, not even toothache, could claim immunity from his lancet.

Patin was of considerable note in the profession and became Professor at the Collège Royal (1654) where his duties included lectures on botany, pharmacy and anatomy,

[1] "Guy Patin and the Medical Profession in Paris in the XVIIth Century," by Francis R. Packard, M.D.; 1925. New York: Paul B. Hoeber; Incorporated. Post 8vo., pp. 334, with seventeen illustrations, including nine full page plates. Price: $4.00 net.

the latter supplemented by four public dissections on the cadaver. He had previously been elected Dean of the Faculty in 1648, the greatest honour within the reach of a physician. Under his control the Faculty triumphed over the rising pretensions of both surgeons and apothecaries. He stands a satirical and dogmatic figure in the transition stage between mediæval and modern practice. He abhorred equally the Arabian school of medicine and the new chemists such as Van Helmont. Discarding the polypharmacy so well exemplified in Theriaca, with its sixty odd ingredients and various occult remedies as unicorn's horn, bezoar stones and mummy, he failed to see any good in opium and quinine with which Sydenham was so successful. He held by Hippocrates and Greek medicine. For example, he bled like them from the same side, not as with the Arabians from the opposite side of the body. He failed to imbibe the Greek scientific method of inquiry and passed over completely the value of Harvey's discovery of the circulation.

His attitude of mind did good by helping to free medicine by salutary criticism of an enormous mass of charlatanry. His misfortune was to miss the great wave of scientific discovery which, inaugurated by Harvey, added so much to our knowledge of pathology, physiology, chemistry *et cetera* during the latter half of the eighteenth century.

Dr. Packard's book is full of information regarding Patin's life and activities, his literary and bibliophile interests, the state of the Faculty of Medicine and the medical course of the times and the general social and political *milieu* in which he lived. It is both scholarly and entertaining and redounds to the credit of our transpacific colleagues.

THE PRESERVATION OF HEALTH AND MEMORY

LORAND'S "Defective Memory, Absent-Mindedness and Their Treatment" is in reality a treatise on good health and how to preserve it.[1] The author deals first of all with memory. He shows that memory depends on the integrity of the cortical cells and their intercommunicating fibres. Any pathological changes occurring in these cells or fibres, as in arteriosclerosis, senility and general paresis, will lead to defective memory.

The psychology of memory and memorizing is carefully dealt with. He condemns the present system of school education and advocates that the phonograph and picture film should have a place there.

More than one-half of the book is taken up with bodily ailments and their effect on the memory. Arteriosclerosis especially is a disease to be guarded against. "Arteriosclerosis of the brain . . . . is the disease or rather the fatal disease of intellectuals." Thyreoid changes and intestinal toxæmias have also a powerful influence on memory and the author deals with them at inordinate length.

In the treatment of defective memory bodily changes must be first combated. Thyreoid deficiency must be made good. Iodine is especially recommended. Intestinal toxæmia must be eliminated. Sir Arbuthnot Lane has in Lorand a worthy follower! If the defective memory is due to senility, rejuvenate the patient with thyreoid *plus* fresh gonadal extracts. In addition expose the patient to ultra-violet rays and give him a course of mud baths. The author claims considerable success by using these methods. Rejuvenation operations are examined and condemned. Prevention, however, is the ideal treatment. If a man wishes to live long and preserve his memory, he must live a well regulated life. His food must be plain and simple, he must take ample rest and exercise and, above all, must he avoid stimulants. Tobacco and alcohol are strongly condemned. If a man feels that he must have a stimulant, tea and especially coffee are allowed. So much faith has the author in the virtues of coffee that he recommends as an ideal drink coffee prepared according to the style of the nomad Arabs.

Towards the end of the book the author defines absent-mindedness and gives a number of rules for treatment.

The author neatly illustrates his remarks with the characteristics of men famous in science, literature and the arts.

Although very readable, the book is discursive and rambling and no set plan seems to have been followed in its execution. A thousand and one subjects are touched on. The Freudian doctrines are not forgotten, but the author leans to the physical rather than to the psychological basis of mental disorders.

As a treatise on the preservation of health and for its many helpful suggestions in building up and improving the memory the book can be recommended to the medical profession.

A BOOK FOR HOSPITAL MATRONS.

IN a volume entitled "Hospital Housekeeping and Sanitation," Miss Nora Hurst, of the McKeesport Hospital, Pennsylvania, records her extensive experience in matters of hospital keeping and sanitation.[1]

The book consists of ten chapters dealing in a lucid manner with cleaning, furnishing, equipment, heating, lighting, plumbing, linen and laundry in their relationship to hospitals. The text is presented essentially from the teaching standpoint to nurses and outlines practical demonstrations in detail. There is little which can be criticized in the text, in its application to Australian conditions. It is felt that the volume may be sincerely recommended in particular to matrons in charge of the smaller country hospitals of the Commonwealth and also of private institutions. Every contingency that may arise, is clearly dealt with and presented in such form as to be available for immediate reference.

Analytical Department.

"OSTELIN."

ACCORDING to the pamphlets issued by the manufacturers, Joseph Nathan and Company, Limited, "Ostelin" is a concentrated extract of cod liver oil, which when diluted two thousand times has all the medicinal activity of the original crude oil. It is claimed that the vitamins contained in cod liver oil are not altered in the process of preparation. It is further stated that all the indigestible fatty substances have been removed.

We have submitted a sample of "Ostelin" to our analyst, but have not yet subjected the preparation to physiological tests for the determination of its accessory food factor content. It appears that "Ostelin" contains 43·2% of water and volatile odoriferous principles, 50% of glycerol and unsaponifiable matter, 6·8% of fatty acids and morrhuine and traces of inorganic substances, such as potassium and sodium chloride. "Ostelin" is a fragrant, lemon-coloured, turbid liquid, heavier than water. It is miscible with water or with alcohol, yielding a turbid liquid, pleasant in odour and taste. The cod liver alkaloids are present, while the fat has been removed. The active principles of the oil are therefore presumably taken up in glycerine. The analysis does not indicate the degree of concentration that has been effected in the manufacture. Naturally no indication can be gained from chemical examination as to the presence or otherwise of fat-soluble *B* vitamin. It is claimed that four drops of "Ostelin" is equivalent to one drachm, that is 3·5 mils, of cod liver oil. If this is the actual concentration, it would follow that "Ostelin" in glycerine represents fifteen times the therapeutic value of cod liver oil, measure by measure. The fact that fifty parts in each hundred represent unsaponifiable matter supports this assumption. Although the final estimation of its value cannot be determined until its vitamin content has been estimated, it appears to be justifiable to state that the claims of the manufacturers can be accepted.

[1] "Defective Memory, Absentmindedness and their Treatment," by Arnold Lorand, M.D.; 1926. Philadelphia: F. A. Davis Company. Royal 8vo., pp. 347. Price: $3.00 net.

[1] "Hospital Housekeeping and Sanitation," by Nora P. Hurst, R.N.; 1926. St. Louis: The C. V. Mosby Company; Melbourne: Stirling and Company. Crown 8vo., pp. 155. Price: $1.25 net.

The Medical Journal of Australia

SATURDAY, MAY 21, 1927.

Noblesse Oblige.

THE honorary system which is in vogue in the large metropolitan hospitals of the Commonwealth, has provided these institutions for many years with medical, surgical and specialist services of a high order. Although students of the question have read the writing on the wall and see that the system is doomed, it will be some time before any drastic change is made. With the trend of modern medicine and the highly specialized nature of every branch of medical practice some of the qualifications for membership of an honorary staff have changed. Of necessity more is required of a member of a staff. He probably attends fewer patients, but has to give more intensive study to the condition of each person who comes under his care. In these circumstances neither the physician, nor the surgeon, nor the specialist in other branches can work as it were in a watertight compartment. He cannot always say: "This patient is suffering from a condition which my specialized knowledge enables me to probe to the bottom." He must collaborate with his brother honoraries. Nor is it likely that such collaboration will invariably reveal all that is to be discovered of the nature of the patient's illness, that no unanticipated or misunderstood emergency will arise and that in the event of death the *post mortem* examination will reveal only lesions that were known in nature and extent during life. Collaboration is necessary nowadays to a degree which has hitherto not been known. Herein lies one of the reasons for the inauguration of staff meetings and hospital clinical societies. These meetings were never intended to be display depôts for the self-preening recital of interesting findings, for the dramatic demonstration of scars from unusual albeit successful operations or for the grandiose exhibition of rare specimens. Rather were they ordained for the mutual help that one member should be to another, for the unravelling of knotty problems, for the frank discussion of mistakes and for outpouring of the experience of the senior man to slake the thirst for knowledge of his junior as well as for the application of the zeal and youthful enthusiasm of the junior in stimulation of the senior. In other words they were aimed at the more complete knowledge of disease processes and the more satisfactory treatment of the patient.

When Dr. W. J. Mayo and his band of enthusiasts visited Australia a few years ago, talk about hospital standardization, and staff meetings and record taking and so forth became quite the fashion. That this journal had previously advocated all these things was not recognized. It required an American deputation to arouse interest. Clinical societies sprang into being at hospitals which had previously been strangers to such happenings, and attempts to hold staff meetings were made. The time has come to take stock and to ascertain whether the wave of enthusiasm has not developed into a back-wash, to discuss the reason for any change and to find a remedy.

It may be stated with confidence in the first place that there were those who stood unmoved at the new departure of staff meetings, but it is unfortunately true also that many who started with zest, have grown weary in well-doing. In certain of the large hospitals the clinical meetings are languishing and bid well to die of inanition. What can be the reason? Is this apathy due to laziness? Has the novelty ceased to attract? In some cases this may be so. Is the lure of many guineas to be made in private practice stifling the scientific ideal? Fame and a fashionable practice are known to provide self-satisfying excuses. Is it due to a dog-in-the-manger attitude towards brother practitioners? The vast majority of Australian practitioners are not false to the tenets of the freemasonry of medicine. Is it due to a sense of security in the hospital appointment and in the kudos which such a position gives the holder? Without a doubt this looms large in the foreground of the picture. In many instances it is in all probability due to a combination of all these factors.

What is the remedy? Either the individuals concerned must realize their responsibilities and accept

them or this realization must be forced on them by the boards of management. It may be objected that to seek the first of these alternatives is like asking the "man with the muck rake" to lift himself out of the mud by the nape of his own neck. The objection would not be valid, for the fall from grace has but seldom been so great as the simile would indicate. The recovery would not demand so great an effort. The other alternative is one which should be considered apart altogether from the question at issue. At the present time appointment to the honorary staff of a hospital is practically a life appointment. At any rate it extends over a considerable number of years and during this period reappointment in many hospitals is made at stated intervals. It is considered unethical for a medical practitioner to oppose another who is seeking reappointment to a staff and in the majority of hospitals promotions on the staff are made in the order of seniority. Both these conditions could be altered with advantage to everyone concerned. Not infrequently a man of promise, appointed to a staff in the early years of his professional career, does not come up to what might reasonably be expected of him. Moreover, a man of mediocre ability cannot help gaining a certain amount of skill from years of association with a large clinic, but the chances are that he will always remain mediocre. He may be excluding a man of brilliant attainments. It is not right that an institution should be saddled indefinitely with individuals of the types mentioned. Promotion and reappointment should be made on the standard of a man's work—on the results of his treatment, on his teaching ability, on the way in which he plays his part in the corporate life of the staff, and on his contributions to knowledge in the medical press. The details of such a method must be left to the boards of hospitals who control the appointments, and the honorary staffs who supply the workers. In any case the members of Australian medical staffs must abandon the untenable attitude adopted by them on more than one occasion when they have refused to censure a colleague who was obviously defaulting. The honorary staffs exist to serve the hospitals and are not an inviolate sanctuary for their members.

Current Comment.

THE TOXICITY OF HUMAN SERUM.

WHEN horse serum was first used on a large scale in the treatment of diphtheria clinicians had no misgivings concerning any deleterious effects. Soon, however, it became apparent that serum sickness was a serious disadvantage of antitoxic serum. The pyrexial illness was both severe and frequent in the early days. Some years later Charles Richet and Rosenow and Anderson discovered that foreign protein, in itself but little toxic, was capable of inducing a hypersensibility after injection of even minute quantities and that subsequent injections of the same protein were followed by serious and lethal effects in hypersensitive animals. The phenomenon of anaphylaxis was found to have wide application, but in the course of a few years its significance was exaggerated and distorted by clinicians and others who had not gained a clear conception of the process as described in the simple experiments that led to the discovery. Everything that could not be explained by ordinary chemical or biological rules, was regarded as anaphylactic. At the same time the real danger that often appeared when horse serum was injected into a person who had at some previous time been treated with subcutaneous injections of horse serum, was recognized and steps were devised to remove the danger. Close study has revealed much that was formerly misunderstood and the application of the term anaphylaxis is again being restricted to its legitimate sphere. A new problem has been set up by the introduction of the use of human serum in the treatment of disease. It is employed in the form of the serum of convalescents from poliomyelitis and of persons who have had this disease months or even years before. The clinical application of human immune serum does not appear to be associated with any deleterious effects. It appears from the records published by Dr. Jean Macnamara and other practitioners in Melbourne and in Sydney that untoward results of this serum treatment of poliomyelitis have not been encountered. The experience of clinicians in Great Britain and in foreign countries has been the same. It is, however, conceivable that trouble might be encountered if human serum were injected at considerable intervals in the same person. No doubt precautions against anaphylactic symptoms would be taken and dangerous results would be evaded. There appears to be a possible danger of a different kind connected with the injection of human and probably foreign serum. E. H. Chant and L. N. Gay have conducted experiments with the object of ascertaining the nature of the reactions that follow intracutaneous injections of some samples of human serum.[1] They start by ascribing the hypothesis of the formation of a substance called anaphylatoxin to Novy. Surely it was Friedberger who first used this term to explain the effect of the toxic dose in a sensitized animal or man. Novy is

[1] *Bulletin of the Johns Hopkins Hospital*, February, 1927.

supposed to have discovered that human serum becomes toxic after coagulation as a result of the formation of anaphylatoxin. The phenomenon with which Chant and Gay deal, has nothing to do with anaphylaxis. They found that when human serum was collected aseptically and injected without previous heating into the skin of another person, no reaction occurred. When the serum was heated to 56° C. for thirty minutes or more, it gives rise to a definite skin reaction. They describe the appearance and dimensions of the area of redness and of the wheal. The reaction was found to increase if the period of heating of the serum was prolonged up to two hours. A similar result was obtained with heterologous human serum, but foreign serum, such as that of a guinea pig, did not have this effect. The unheated foreign serum produced a more definite reaction than the heated serum. Curiously guinea pig's serum caused no reaction in the guinea pig.

The authors are not justified in describing their experiments as a study of the local reactions produced by the intracutaneous injections of human toxic serum into human skin. The serum is not toxic. Assuming that the results recorded can be confirmed, it would appear that human serum can be injected without inducing toxic symptoms either locally in the skin or generally, provided that the serum is fresh and in the condition in which it occurs after it separates from clot. But if the serum is heated above 50° C. and below 60° C., it acquires the property of inducing an irritation in the skin. The same irritation can be set up by serum that has been kept unheated for several weeks. The authors discuss three hypotheses that might explain the phenomenon. The first is that the complement of the serum is destroyed. Apart from the fact that the complementary action of serum is removed by heating to 56° C. for three minutes and that the skin reactions are more intense when the serum has been heated for two hours than when it has been heated for thirty minutes, it has been shown that the complement action of an inactivized serum can be restored by continued heating at a high temperature. It is reasonable to assume that complement is not a substance, but merely the physiological effect of a peculiar molecular arrangement of globulin; inactivizing means the modification of this molecular arrangement of a particular group. The second hypothesis is that the change is dependent on an alteration in the antiferment-ferment balance. The authors show that prolonged heating tends to raise the antiferment titre rather than to lower it. The effect of heat continued for two hours on a mixture of antiferment and ferment would be either negligible or both would be put out of action. The third hypothesis suggested is that the colloidal state of the serum is altered. While it is evident that heating or prolonged storage must result in a change in the surface tension of a solution of a colloidal substance, this physical change is always accompanied by profound chemical changes as well as other physical ones. It must be remembered that the serum is not rendered toxic; the change is a slight one under the conditions of experiments followed by Chant and Gay. Moreover, they maintain that it does not occur in the guinea pig. This suggests that it is not a profound chemical or physical change, but a slight modification with a strict biological significance. It should be studied, for it might appear in a more serious form under certain special conditions. Serum used in the treatment of poliomyelitis may have to be stored for considerable periods and it becomes necessary to know if it might have damaging effects.

"CHILLING OF THE LIVER."

PROFESSOR R. W. MENDELSON[1] has recently endeavoured to determine whether there is any scientific foundation for the popular idea that the drinking of iced fluids in hot weather causes a "chill of the liver." He anæsthetized six dogs with ether, exposed the stomach and placed thermometers into the quadrate lobe of the liver, into the fundus of the stomach and into a pocket between the muscular coat and the submucous coat of the stomach. A fourth thermometer was placed in the rectum. Half a litre of iced water at 3° C. was then introduced into the stomach through a tube lying in an opening in the cardiac end of the organ. Although the water was not poured in until the temperature registered on all the thermometers was normal, it is difficult to regard the readings as a measure of the physiological effect of the lowered temperature alone. It appears that the temperature in the interior of the stomach was immediately lowered and did not regain the previous level for over half of an hour. The average drop was 16·04°. The temperature of the liver and in the rectum were lowered to a much less degree, the averages being 2·25° and 2·45° C.. Professor Mendelson does not regard this evidence of a cooling due to the iced water. It may have been caused by the operative disturbance. Lastly the temperature of the gastric wall was decreased on an average by 10·55°. His experiments thus showed that when iced water was introduced in large quantity into the stomach of a dog, the temperature of the gastric wall fell abruptly and did not return to the previous level as quickly as did the temperature of the interior of the stomach. There is nothing surprising about this. It may be assumed that the lowering of the temperature inside the stomach can have no baneful effect on the body generally or on the liver. A curious observation was made. It was that before the introduction of the iced water, the temperature of the stomach wall was lower than that of the interior of the organ. The author has no explanation to offer for this phenomenon. Of course, it may have been caused by the surgical trauma. But if it should prove to be independent of the operation, it is possible that the heat liberated by chemical action of the gastric contents would not reach the tissues whose temperature is governed by heat supplied by the oxidation of food products held in check by the heat regulating apparatus.

[1] *The Journal of Tropical Medicine and Hygiene*, March 1, 1927.

Abstracts from Current Medical Literature.

RADIOLOGY.

Ulcerative Colitis.

R. D. CARMAN AND A. B. MOORE contribute a paper on ulcerative colitis (*American Journal of Roentgenology*, July, 1926). Ulcerative colitis is defined as that form of colitis not caused by parasites, tuberculosis, dysentery, actinomycosis or syphilis. It is uncommon and records of six hundred cases have been collected in the Mayo Clinic. A properly taken history, careful examination of the stools, proctoscopy and radiological examination will usually establish the diagnosis. Diarrhœa is the chief complaint. The condition may be more or less chronic and the patients suffer from but little reaction or it may be acute and accompanied by extreme prostration. The stools are profuse and watery and contain much blood and mucus. With the proctoscope the bowel may be examined for about thirty centimetres and areas of ulceration which begin in the rectum and extend upward, can easily be demonstrated. The process begins with small superficial ulcers in the rectum involving only the mucosa. These heal and break down and gradually extend upward until the entire large bowel is affected. Later the deeper intestinal coats are penetrated with round cell infiltration, abscess formation and fibrosis with thickening of the walls and obstruction of the lumen. When an enema is administered, spasm of the bowel occurs due to irritation of the ulcerated areas. The bowel quickly fills and the walls of the bowel are smooth and lack the usual haustration. The ileo-caecal valve is usually incompetent. These appearances are due to thickening of the walls and the conversion of the colon into a straight tube. Carcinoma and syphilis are characterized by obstruction with proximal dilatation of the bowel. Tuberculosis is usually found in the caecum and the ascending colon and these organs fill and empty rapidly in a characteristic manner. Diverticulosis produces the characteristic extraluminal shadows.

"Lipiodol" in Pelvic Diagnosis.

I. C. RUBIN AND A. J. BENDICK contribute a paper on the use of "Lipiodol" in the diagnosis of uterine and tubal diseases (*American Journal of Roentgenology*, September, 1926). The authors prefer to use carbon dioxide gas for testing the patency of the tubes and when the tubes have been proved to be blocked they use "Lipiodol" for demonstrating uterine and tubal abnormality. With the aid of a Graves's vaginal speculum the cervix and vagina are carefully cleaned and painted with tincture of iodine. The anterior lip is then grasped with a tenaculum and a uterine cannula is introduced into the uterine cavity. "Lipiodol" (five to ten cubic centimetres) is then injected slowly until the uterine cavity is half filled and then a halt is made to see whether uterine contraction occurs. The "Lipiodol" is then injected under radiological control to full capacity (usually five cubic centimetres). By this method two classes of cases may be studied: (i) those in which the tubes have been removed, (ii) those in which one or both tubes are visible. The thin intramural and isthmic portions and ampulla are seen and then the fimbriated end and if the tube is patent the "Lipiodol" is seen to enter the peritoneal cavity. Later skiagrams are taken. "Lipiodol" remains unabsorbed for months and so the amount used should be reduced to a minimum.

Cholecystography.

W. H. STEWART AND E. J. RYAN (*American Journal of Roentgenology*, September, 1926) discuss the reliability of cholecystography after oral administration of sodium tetraiodophenolphthalein by an analysis of one hundred consecutive cases. The majority of patients were between the ages of thirty and forty years. Fifty-five weighed between 50 and 68 kilograms (110 and 150 pounds) while only 8% were over 90 kilograms (200 pounds) in weight. The authors state that there is very little disagreeable effect after the oral administration of the drug and in no instance was the patient incapacitated. From a consideration of this series and of over three hundred other cases the authors are satisfied that oral administration gives as good results as intravenous administration. The oral method is simple and causes no severe reaction and may be used without admitting the patient to hospital. In regard to technique it is absolutely essential that the patient should hold his breath. A fatty meal should be given on the night before examination as this empties the gall bladder and places it in a receptive condition for the opaque bile. Fresh drug is also an essential and the authors advise buying the drug in sealed ampoules and placing it in keratin-coated gelatin capsules. No food should be taken for sixteen hours after the drug is taken.

Myositis Ossificans Traumatica.

R. W. FOUTS (*Archives of Physical Therapy, X-Ray, Radium*, August, 1926) writes on the occurrence of *myositis ossificans traumatica*. The cause of the bony formations in muscle is not definitely known. The condition is usually seen in the second and third decades of life and the *quadriceps femoris*, biceps and *brachialis anticus* muscles are the most frequently affected. Ossification in the chest muscles has been recorded as in *myositis ossificans progressiva*. Periosteal and bone cells may be torn loose by muscle effort or external injury and thus determine the ossification away from the bone in the muscle substance. Injury may cause necrotic tissue which later calcifies and bone formation occurs about the edges of the mass. The process begins in the fascia, aponeurosis or periosteum and involves the muscles secondarily. A connective tissue hyperplasia, a sclerosis of this connective tissue and a formation of cartilage and bone in this sclerosed area take place and this bone is apparently normal in structure. The muscle fibres undergo some atrophy and degeneration.

Radiography of the Colon.

W. O. UPSON contributes a paper on the technique of X ray examination of the colon (*American Journal of Roentgenology*, November, 1926). Proctoscopic and sigmoidoscopic examinations are of limited use, while fæcal examination is often misleading. The colon should be examined by meal and by enema. The meal allows observation of mobility, size, shape and position of the colon, adhesions or obstructions, filling defects, colitis, diverticulitis *et cetera* and after all possible information has been obtained from the meal, an enema should be given. The bowel is washed out three times and a gravity can, with a pressure bulb in the rubber tube line, is used. The patient inserts the tube himself and a mucilage suspension of barium sulphide is used. The enema is watched as it runs in and fills the bowel and should it tend to clog in the tube, a squeeze of the bulb will free it. The enema hesitates for a while at the pelvi-rectal junction and then passes quickly through the pelvic loop. Manipulation should show whether adhesions are present. The enema also flows quickly through the iliac and descending colon. Delay at the flexures is usual and the patient should be rotated to gain a view of the loops in these regions. Blockage and palpable tumour are seen in carcinoma with a filling defect. It is a good plan to reexamine the patient after evacuation of the enema.

Aortic Regurgitation.

G. W. HOLMES records his observations in cases of aortic regurgitation (*British Journal of Radiology*, November,1926). This condition may result from (i) "rheumatic" endocarditis with ulceration, fibrosis and contraction of the valves, (ii) syphilitic ulceration and erosion of valves, (iii) dilatation of the aorta, for example aneurysm, (iv) arteriosclerosis of the aorta with imperfect closure of valves, (v) hypersensitive heart disease and dilatation of the aorta, (vi) severe anæmias, (vii) traumata. Prognosis depends on the type of infection. Syphilis means a serious prognosis, while the outlook is more favourable in "rheumatic" conditions. Fluoroscopy with teleskiagrams are used (2·1 metre or seven foot distance). Fluoroscopy reveals the size, shape and pulsations of the aorta and heart and examinations are made in antero-posterior, postero-anterior, right lateral oblique and left lateral oblique positions. The movements of heart and diaphragm are noted and tracings are made. In photography the tube is centred over the base of the heart. It is possible to state (i) the size and

shape of the shadow of the heart and great vessels in the antero-posterior and lateral views, (ii) the presence of abnormal pulsations or masses, (iii) the character of pulsations of the various chambers, (iv) the respiratory excursion of the heart. The heart shadow is characteristic, the curve of the left ventricle is rounded and the apex blunt, while the long axis approaches the horizontal; the left ventricular pulsations are distinct. With other valves involved the increase in size becomes general. Syphilitic regurgitation causes increase in supracardiac dulness just above the heart and to the right of the sternum with abnormal aortic pulsations and pyramid shadows in the region of the innominate and subclavian arteries. The hypertensive heart has more sharply defined chambers than the syphilitic heart. In arteriosclerosis the aorta is tortuous rather than dilated and the aortic knob is prominent, while calcified plaques may be visible.

PHYSICAL THERAPY.

Treatment of Keloids.

G. W. GRIER (*American Journal of Roentgenology*, July, 1926) deals with the subject of treatment of keloids by radiation. The best results obtained by the author have been from unfiltered X radiation, regardless of the size or thickness of the lesion. An erythema dose should not be given (about 90% of an erythema dose is recommended) and the treatments should be widely spaced, the interval generally being two months, so as to allow complete recovery between sittings. A 17·5 centimetre (seven inch) parallel gap is used.

Actinotherapy in Cutaneous Tuberculosis.

P. FRANCIS, L. DEKEYSER AND HALKIN (*Journal de Radiologie et d'Électrologie*, January, 1927) discuss the various methods of treating tuberculous affections of the skin. They adhere to Pautrier's classification into true tuberculous infections, attenuated infections and tuberculides. Lupus should be only rarely treated by surgical measures (excision, curettage or linear scarification) or by electric or chemical caustics. The use of carbonic acid snow is recommended when the patch of lupus is small or is fungating on a mucous surface or in cases of *lupus erythematosus*. Electrotherapy, high frequency currents, diathermy, X ray therapy and radium therapy have extremely limited spheres of usefulness. Phototherapy is the most suitable form of treatment. Of the various sources of actinic radiation the Finsen light is chosen as giving the best clinical results at the present time, but to obtain these Finsen's methods must be followed in all details. For general usefulness and convenience the mercury vapour lamps are to be preferred. Focal treatment with use of the longer wave lengths with compression and water cooling brings about rapid improvement going on to cure in many cases, but general actinotherapy has been found, when used in conjunction, to hasten the treatment and to increase the percentage of successful results. Still further improvement occurs both in the time required and in the final results, if regional actinotherapy is administered at the same time. Prudence is requisite when the lesions are very extensive or the patient is very debilitated and pulmonary tuberculosis with rise in temperature is an absolute contraindication. The cure now requires as many months as in former days amelioration required years. Patients improve so rapidly that there is not the same difficulty in keeping them strictly under treatment. Tuberculin has not succeeded in these cases as well as was anticipated. Up to 90% of cures result under complete treatment. The scars are supple and smooth and more æsthetic than those from any other form of treatment. In the case of female patients the head must be well protected during treatment to guard against increased growth of facial hair.

Radiotherapy and Hydatid Cysts.

F. DÉVÉ (*La Presse Médicale*, February 12, 1927) writes that in 1922 he irradiated hydatid sand with doses varying from five Holzknecht units to twenty Holzknecht units before inoculating it into the subcutaneous tissues of a rabbit. All the inoculations gave positive results without lessening or alteration of the biological characteristics. In 1924 unfiltered irradiation of similar sand with doses of from 4,000 Röntgen units to 20,000 Röntgen units (Solomon's ionometer) *in vitro* produced no morphological change in the elements—not a single scolex was broken or deformed and all manifested their customary movements on being warmed. After one, two or three months, however, all these scolices showed degeneration ending in death. He concludes that the lethal dose for the hydatid scolex is rather more than 20,000 Röntgen units and that, as it is impossible to administer such a dose to a patient with impunity, radiotherapy of hydatid cysts is valueless as a curative measure.

X Ray Treatment for Myoma and Hæmorrhagic Metropathy.

FRANZ BARDACHZI (*Strahlentherapie, Band* XXI, 1926) recommends the administration of the X ray treatment for myoma and hæmorrhagic myopathy at a single sitting if possible. This is particularly necessary in cases of urgency when there is an association of acute hæmorrhage with high grade anæmia. These patients also require support for the ovarian treatment by irradiation of the spleen and liver. Such procedure is accompanied by excellent results. Smaller doses, repeated should menstruation reappear three times, are justifiable in older women with mild hæmorrhage and symptoms. The distant field method is the least dangerous in robust patients with large tumours, as it insures uniform radiation of the myoma and a certainty of including the ovaries in the radiation. Medium compression will shorten the time of irradiation by diminishing the depth. The factors which are required with a Stabilivolt apparatus are 3·5 milliampères of current, a kilovoltage of 200, a filter of 0·5 millimetres of copper, fifty centimetres distance and a full skin dose for not more than two and a half hours. This will produce castration in a big, robust patient. Weaker patients require smaller doses and the time factor may be further reduced by decreasing the focus skin distance. In very debilitated patients by exposing both ovaries simultaneously with a focal skin distance of thirty centimetres the time required may be still further reduced.

Measurement of Dosage in Actinotherapy.

LEONARD A. LEVY AND DONALD W. WEST (*The British Journal of Radiology*, October, 1926) divide methods already in existence for measuring ultra-violet radiations into physical which are open to the objection that very delicate instruments are required, biological which are not suitable for routine work, and chemical which require the use of analytical methods. The differences in the spectra given by various sources of ultra-violet light make it imperative to have some easy method of estimating the erythema dose time of any source. Exposure pastilles were used with success in X ray work, so a search was made for a substance which could be used in a similar manner with ultra-violet light. It was apparent that this substance should have certain definite characteristics. It should not react to visible radiations nor to a reasonable degree of heat; it should give the same range of tints for ultra-violet light from various sources and should be sensitive to all lengths of therapeutically active radiations; it should be stable and sensitive. Such a substance was made from chloral formamide and diphenylamine. It is sensitive to all radiations from 3,800 to 2,300 Ångström units. The colour changes produced by exposure to a tungsten arc taking a current of three milliampères at thirty centimetres (one foot) distance for five minutes was taken as one unit. This is the minimum amount of radiation that will produce an erythema on a white skin. The tints assumed after exposure for ten, fifteen, twenty, twenty-five, thirty, thirty-five and forty minutes were taken as corresponding to two, three, four, five, six, seven and eight unit doses. In practice the tint assumed by the pastille is compared to eight permanent glass standards tinted to correspond to these eight units. Exposures made with the pastilles with and without the interposition of Vita glass will enable an idea to be obtained of the relative proportions of short and long wave lengths present in the radiations from any source. The use of the pastilles obviated the need of a timing clock.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Medical Society Hall, East Melbourne, on April 6, 1927, DR. R. J. BULL, the President, in the chair.

Influenza.

DR. J. P. MAJOR read a paper entitled "Influenza" (see page 744).

DR. F. R. KERR read a paper entitled: "Influenza: Its Epidemiology and Prevention" (see page 747).

DR. R. P. MCMEEKIN read a paper entitled: "Pathology and Clinical Features of Influenza" (see page 750).

DR. A. V. M. ANDERSON said that he had had experience of two epidemics of influenza, that of 1891 and that of 1919, the latter being much more severe. Before the epidemic in 1891 patients with catarrhal bronchitis of a somewhat unusual kind had been seen at the Melbourne Hospital and the condition was known as "fog fever." In Victoria, in anticipation of the 1919 outbreak, a board had been appointed with the late Sir Harry Allen as chairman to report cases of influenza at once, so that steps might be taken to prevent the spread of the disease. As subsequent events showed, it was almost certain that the disease had appeared before the appointment of the board. It was almost impossible to prevent the spread of a disease so infectious. In New South Wales, in spite of rigorous quarantine, the attempt to prevent the entry of the disease from Victoria had not been successful. At the Alfred Hospital there had been four tents for the severe pneumonic cases. Most of the nurses contracted influenza, but only in a mild form and with no pneumonic complications. He thought that this was largely due to the fact that they had been sent to bed as soon as any rise in temperature occurred. It also suggested that the primary disease was not dangerous, but that the complications due to streptococci and pneumococci were the serious factors in mortality. He believed that prophylactic vaccination was beneficial not only in influenza, but also in common colds. In a series of three hundred vaccinated employees observed by him there had been no serious cases and in military camps in America deaths had apparently been much fewer in the inoculated.

With regard to treatment many drugs had been tried, including salicylates, creosote and iodide of potash, but he had not found any of much value. Reliance had to be placed on general measures, such as rest, nursing and hygiene. In some cases lung complications had developed with startling rapidly. He thought that digitalis, if given early in pneumonic cases was of distinct value. Two classes of patients, in addition to those mentioned by the opening speakers, did badly, these were the obese and the alcoholic. Empyema had been commoner at the Alfred than at the Melbourne Hospital and it had occasionally been double. He thought that those patients who had been treated by aspiration or by simple opening of the pleural cavity followed by closure, had done better than those in whom rib resection with drainage was performed. The treatment of empyema needed very careful consideration. He urged the necessity for organization, if an epidemic appeared imminent. He congratulated the opening speakers on the papers presented.

DR. H. F. MAUDSLEY said that he had seen patients with *encephalitis lethargica* whose symptoms had dated from a mild attack of influenza. He asked Dr. Kerr whether there was any relationship between influenza and epidemic encephalitis and whether the after history of patients suffering from mild influenza had been traced.

DR. H. C. DISHER said that in June, 1918, he had had experience of an influenza epidemic in a unit of about eight hundred or nine hundred troops, more than half of whom had been attacked within a month. The epidemic had followed a very definite course, four groups of cases occurring in sequence. In the first group the infections were relatively mild with the usual febrile symptoms and general aches and pains. In the second the symptoms were more severe and acute headache was the prominent symptom. In the third group gastro-intestinal features were prominent, but as yet there had been very little cough or tracheitis which were the main features of the fourth group. Brigade headquarters which had been separated from the other troops, had not been affected. In the last group, cases of which did not appear until November, respiratory signs and symptoms had been present. Generally speaking the younger the soldier, the more severe was the attack. About twenty had been evacuated and of these seven had suffered from pneumonic influenza and at least three had died. One patient, over forty years of age, with intense cyanosis, had recovered although the medical officers had several times despaired of his life. The man suffered from chronic bronchitis and asthma. As far as Dr. Disher could remember none of the patients with pneumonic influenza had suffered from influenza in the previous epidemic.

DR. A. P. DERHAM had observed an epidemic on a troopship which had passed through much the same phases as those described by Dr. Disher. There had been about thirty deaths, some with acute hæmorrhagic features. None of the nurses had contracted influenza in a severe form, in spite of the fact that many with mild symptoms had remained on duty. He thought it probable that a mask could be made which would effectively act as a filter. If argyrol were placed in the eye, it would appear in the nose earlier than in the throat and the place in the nose where it would first be felt, was the site first involved in the common cold. This might indicate that eye infection was commoner than usually supposed and he therefore advised the adoption of a mask covering both eyes and nose with glass or celluloid eye pieces.

DR. J. NEWMAN MORRIS pointed out that in the papers presented little reference had been made to the definition of the term influenza and to diagnosis. About 30% of the work of a general practitioner was made up of acute respiratory infections. Were these to be regarded as being mostly influenzal and if not, how was true influenza to be recognized?

Influenza was sometimes looked upon as the refuge of the diagnostically destitute and during an epidemic there were many possibilities of error. Conditions presenting features of a low grade infection and lasting sometimes for several weeks, when no definite cause could be discovered, were frequently labelled influenza. Was this justifiable and if so on what grounds? He had seen patients without pneumonic complications whose condition had resembled acute appendicitis, and operation had revealed a normal appendix. Little reference had been made to the surgical aspects of influenza, although at the Melbourne Hospital surgical complications such as empyema and arthritis had not been common. He thought with Dr. Major that the disease might prepare the way for streptococcal and pneumococcal infection. He drew attention to the fact that Dr. McMeekin had been the first to recognize the existence of the 1918 epidemic in Victoria. He had listened with much pleasure to all the papers presented.

DR. CLIVE HARCOURT had enjoyed all the opening papers. He had had experience of an epidemic in a small country town with a population of about three thousand. About two thousand had been vaccinated before the epidemic arrived and of these only one developed pneumonia. It had been rare to see only one member of a family attacked. The onset in most cases had been abrupt and he instanced the case of a nurse who had died within twenty-four hours of the onset of symptoms. He had found that if hospitals and nursing facilities were organized after the arrival of an epidemic, when everything was completed the disease had already begun to subside. Preparations should therefore be made beforehand.

DR. HENRY MCLORINAN thought that pandemic influenza was probably quite a different disease to the ordinary annual winter variety. Other pandemic diseases were mostly due to a filtrable virus. He thought that the ordinary winter form of influenza was due to the organisms

commonly attacking the respiratory tract, while pandemic influenza was caused by a filtrable virus.

DR. A. J. DAY referred to the acute hyperæsthesia of the scalp seen in patients with influenza. Light touch was acutely painful, while firm pressure was not.

DR. R. J. BULL complimented the readers of the opening papers. It was comforting to hear from Dr. Kerr that the recent outbreak in Europe was the ripple of an epidemic rather than the storm of a pandemic. There were still many points to be cleared up in connexion with influenza. Dr. Major had laid stress on the important points in treatment, especially the value of sleep, oxygen and venesection and the dangers of enemata. Dr. Kerr had mentioned the value of preventing overcrowding in limiting the spread of the disease, but there were still many unknown factors. The sudden onset and the resemblance in some respects of hog cholera which was due to a filtrable virus, suggested that pandemic influenza might be due to a similar cause. He had been very interested in Dr. Disher's remarks concerning the gradual alteration in disease type and he thought that this was due to gradually increasing virulence of the organism rather than to lowering of the patient's resistance. During the interpandemic periods the organism was dormant either in the soil or in carriers and as soon as a pandemic started, the organism multiplied rapidly and adapted itself to the changed environment. He thought that masks were of benefit in limiting the spread of some infections, particularly for nurses and medical men. He had collaborated with Professor Laby in researches on this point and they had found that one layer of gauze was quite insufficient to inhibit the passage of bacteria and small particles of pigment. A mask with four layers would prevent the passage of 90% of organisms, but was too uncomfortable for most patients. He thought that many people reacted favourably to non-specific vaccines and that prophylactic vaccination had done a great deal of good. In London workers in the subterranean railways had had a lesser incidence and mortality than the remainder of the population and he considered that this was probably due to repeated small infections, not necessarily with the influenza germ, but with associated varieties.

DR. J. P. MAJOR in reply said that it was very difficult to give any rigid definition of true influenza, but the sudden onset, the amount of prostration and the severity were the most important points in distinguishing it from the ordinary winter variety. In the latter condition he thought that gastric features were very rare and he was always loth to accept a diagnosis of gastric influenza which usually turned out to be something else.

DR. F. R. KERR thanked the various speakers for the suggestions put forward. He thought that the non-prevalence of influenza in tube workers might have been due to the pumping of ozone down the tubes to purify the air. On theoretical grounds masks ought to be of value, but in practice they had been found to be of no use. In breathing through moist masks many factors such as capillary attraction had to be considered. Although vaccines were of no use in preventing influenza, they might be of value in ameliorating the complications. He had observed an epidemic in a small country town of about the same size as that mentioned by Dr. Harcourt and he had seen no pneumonic infections, although prophylactic vaccination had not been practised. He thought that *encephalitis lethargica* was connected in some way with pandemics of influenza.

DR. R. P. MCMEEKIN in reply to Dr. Maudsley said that he had not seen any patients with influenza who had subsequently became affected by encephalitis. The first case of *encephalitis lethargica* occurred about seven months after the beginning of the influenza epidemic. He thought that masks if made thick enough to be effective, were too uncomfortable to wear. At the Melbourne Hospital two nurses had contracted the pneumonic form of the disease and both had died. Prophylactic vaccination if done early was of some benefit, but if done later, after cases had already appeared, was of no value and might be actually harmful in those, such as nurses and medical practitioners, who were brought into close contact with the disease.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for reelection as a member of the New South Wales Branch of the British Medical Association:

Dr. Albert Lewis Levy, L.R.C.S. (Edinburgh), 1895; L.R.C.P. (Edinburgh), 1895; L.F.P.S. (Glasgow), 1895, 219, Macquarie Street, Sydney.

Public Health.

NATIONAL HEALTH INSURANCE.

REPORT OF THE ROYAL COMMISSION.

THE following is the text of the fourth and final report of the Royal Commission on National Insurance. The report is dated March 11, 1927, and was presented to Parliament during the last days of April.

In our previous progress reports we stated that the questions of membership, finance and administration of the proposed national insurance fund would form the subject of a final report when the other sections of our inquiry had been completed. Our first progress report, dated March 3, 1925, contained the conclusions at which we arrived on the questions of casual sickness, permanent invalidity, maternity and old age. Our second progress report, covering the question of unemployment, was presented on July 30, 1926, and our third progress report, dated December 15, 1926, completed our investigations concerning the payment of destitute allowances.

With respect to the question of making provision for casual sickness, permanent invalidity, old age and maternity, we have recommended that the payment of cash benefits should be separated from the provision of medical benefits, the former being provided through a national insurance fund and the latter coordinated with the public health services. As an essential preliminary to the introduction of any system of unemployment insurance, we have recommended that certain action should be taken towards minimizing the risks of unemployment.

It will thus be seen that in both the questions of public health and unemployment, we have indicated that certain action should be taken in connexion with such matters apart from the national insurance fund. We have, therefore, in this report limited ourselves to the questions of membership, finance and administration of the proposed national insurance fund in which the cash benefits, previously recommended, will be made available to insured persons.

I.—Membership.

Early national insurance legislation covered the employees in specially defined industries only, but the tendency in recent years has been to extend the field of application of national insurance to all persons working under a contract of work, service or apprenticeship without regard to the trade in which engaged; the aim being to make national insurance available for all whose economic position is such that they need to be safeguarded against the effects of the incidence of the various social risks. Nevertheless, in many countries there are still certain conditions limiting the number of persons covered by the insurance system, the conditions being usually those dependent on citizenship, the age of the insured person, the amount of wages received and the nature of the occupation in which engaged. In only the minority of cases are all persons performing manual and non-manual work included without restriction as to age or wage conditions. Certain countries have instituted a system of classification of insured persons according to the trade in which engaged, the list of trades included comprising practically all the important industries in each country.

(*a*) *Limit as to Employment.*

The systems of national insurance in operation make provision in most cases for wage-earners only and are thus system of workers' insurance rather than of national

insurance. In some instances certain classes of workers, particularly non-manual workers, are not subject to the insurance scheme. Agricultural and forest labourers, domestic servants and casual workers are in several instances excluded, whilst those employed by the State, local or other public bodies or by companies which provide benefits at least equal to those given under the national scheme, are in certain cases exempted.

The usual restrictions as to the employments which do not come under the insurance scheme, are those relating to employees receiving above the maximum wage limit, employment without wages, subsidiary employment not the principal means of livelihood, employment which secures benefits of equal value to those given under the national scheme, pensioners, dependants, persons mainly dependent on earnings derived from an occupation outside the scope of the scheme, persons engaged only occasionally or temporarily, small employers, certain classes of home workers, crews of sea-going vessels and persons detained in reformatories. Other provisions are designed to meet the special circumstances of those who are in hospitals, or receiving compensation from employers, also soldiers, sailors and airmen in the defence forces. The scope of national insurance, however, is continually growing wider, the tendency being to extend its benefits to all workers in all industries.

Employment is usually the basis of membership and the provision of benefits for persons not usually employed is generally regarded as supplementary to the main object. Any scheme of national insurance which includes as insured persons other than employees involves considerable difficulties of administration. Membership ceases automatically with cessation of employment unless the insured person continues as a voluntary contributor at his own expense. In one system provision is made that every person who, having been insured as an employed contributor, ceases to be employed remains an insured person and is entitled to all benefits for one year after employment ceases.

Married women who are home workers, are stated not to be an insurable proposition, as there cannot be that necessary supervision which operates over women in other employment, and in some schemes it is definitely laid down that a married woman cannot under any circumstances become a voluntary contributor. Special consideration is required with respect to the difficult questions arising in connexion with women who give up work on marriage, as the change in the economic circumstances of the woman which normally takes place at marriage introduces a complication into insurance administration, and often the status of the insured woman after marriage cannot be immediately determined.

Apprentices and others undergoing a period of industrial training are in most cases included within the scope of compulsory insurance. Seasonal workers and casual workers when employed in certain industries are usually compulsorily insured on the same basis as other workers, provided they depend for their livelihood on such employment. In those countries which have adopted a system of general workers' insurance, domestic servants are also included amongst those eligible for insurance.

The following persons are generally excluded from the provisions of the various *Workers' Compensation Acts* in operation in Australia: Workers over a certain income limit, outworkers, casual workers, members of the employers' family residing in his house, members of the public service and police force and those in the naval or military service of the Crown. The workers included are those who have entered into or work under a contract of service or apprenticeship or otherwise with an employer, whether by way of manual labour, clerical work or otherwise, and whether the contract is expressed or implied or is oral or in writing.

Casual workers, workers on their own account, employers with small incomes, agricultural workers, domestic servants, seamen, immigrants and war pensioners will require special consideration at the inception of the scheme. Nevertheless it is desirable that efforts should be made to include all breadwinners earning less than a certain income within the scope of the scheme, irrespective of whether such workers are employees or workers on their own account, as the exclusion of any section of those workers will necessitate the provision of other forms of assistance being made for them.

(*b*) *Age Limits.*

In most systems the age limits to membership of the scheme are prescribed, but are generally somewhat similar, the minimum being usually about age fifteen and the maximum about age sixty-five, although in some countries no mention is made of a minimum or maximum age.

(*c*) *Wage Limits.*

Although it has generally been found unnecessary to prescribe an income limit in the case of manual workers, yet in many countries the maximum wage which the non-manual worker may receive and still remain a member of the insurance fund is fixed, as it is not considered necessary to compel those to insure who receive wages which are considered sufficient to enable individual provision to be made against the risks of incapacitation for work. The wage limit depends upon the economic conditions and on the standard of wages in the various countries and as a result there is considerable variation with respect to the income limit of wage-earners eligible for the benefits provided. In determining the rate of remuneration of the wage-earner the value of all emoluments received by him in return for his services is taken into account. Where a person is engaged in more than one employment, each employment is considered separately.

It has been suggested that the proposed national insurance scheme in Australia should not cover all wage and salary earners, but should be restricted to those receiving less than a certain income, as it is considered that if an income limit is not fixed many people who do not require assistance, would be eligible for the benefits provided. It has also been suggested that if the scheme were made applicable to all persons in receipt of salary or wages not exceeding £500 per annum, with provision for an extension in the case of married men with dependants, the position would be fairly met. A similar limit might also be applied to workers on their own account and to the small employers of labour admitted to a voluntary scheme.

Under the *Workers' Compensation Acts* of the several States, an employee whose remuneration exceeds the following maximum, is excluded from the provisions of the Act, *viz.*: New South Wales (manual) without income limit, (non-manual) £750 *per annum*; Victoria (manual) without income limit, (non-manual) £350 *per annum*; Queensland (manual and non-manual) £10 per week; South Australia (manual and non-manual) £10 per week; Western Australia (manual and non-manual) £400 *per annum*; Tasmania (manual and non-manual) £5 per week.

The agreements between friendly societies and medical practitioners exclude from medical benefit all members in receipt of annual incomes exceeding in New South Wales £364, Victoria £312, Queensland £400, South Australia £450, Western Australia £400 and Tasmania £312. When receiving more than the maximum income prescribed a member may continue to be eligible for certain medical benefits if he has dependants. The main objection raised by friendly societies to the model agreement relating to medical attendance is in regard to the income limit, as they are generally opposed to any income limit.

It has been estimated that in the year 1921, 68·5% of the total wage and salary earners in Australia were in receipt of an income of less than £200 *per annum*, 94·4% less than £300 *per annum*, 97·5% less than £400 *per annum* and 98·6% less than £500 *per annum*. It will thus be seen that, even when allowance is made for the increase in wages since 1921, the percentage in receipt of higher incomes is relatively small. If an income limit is placed on membership, any future alteration in the standard of wages may have an important influence on the eligible membership of the scheme and a consequent effect on its financial basis. As the result of an increase in wages since the institution of national insurance, it has been necessary in some countries to raise the maximum income limit in order to avoid excluding a large number of workers who would normally have benefited by the scheme if wages

had not increased. When an insured person's income is raised to more than the maximum prescribed, he generally ceases automatically to be liable to the compulsory provisions, but in some cases may continue insurance under voluntary provisions and experience has shown that where a low income limit is prescribed the number of compulsory exits from insurance on this account is very appreciable and results in many anomalies.

(d) Geographical Limitation of the Scheme.

It has been suggested that in many districts in Australia in which the population is very scattered, it will be extremely difficult to administer a national insurance scheme and that if those areas were temporarily eliminated from the scheme, the total number affected would not be large, as only a small percentage of the population is located in such outback areas. It is desirable, however, that the scheme should cover all in need of insurance and the remoteness of a person or of his residence need not exclude him from benefits so long as satisfactory certification as to eligibility for benefit can be obtained. It is considered that workers in the outback areas should be given special consideration and not penalized by any such exclusion from the benefits of the scheme.

(e) Voluntary Membership.

In the event of a system of compulsory insurance being instituted with certain limitations, many employees, workers on own account and employers in small businesses who are exempt from the compulsory provisions of the scheme, may desire to contribute for similar benefits to those available for employed contributors and it is desirable that such provision should be made available. Many breadwinners who are not employees, and who are in receipt of small incomes are often in urgent need of the benefits provided by national insurance. In some schemes provision has been made for the following to insure voluntarily, *viz.*: Persons exempted from insurance, members of the family of the employer without any specific employment and without remuneration, also proprietors of establishments who regularly employ at the most two persons subject to insurance, provided that their incomes do not exceed a prescribed amount.

Although it is estimated that the majority of the insured population will remain wage-earners for the whole of their working lives, yet it is essential that provision be made for those who cease to be wage-earners, and still desire to be eligible for the benefits provided by the scheme and towards which they have contributed for many years. The provision of a surrender value on termination of insurance has not yet been introduced into any system of national insurance against contingencies, as such is undesirable and would considerably affect the financial basis if instituted. Notwithstanding that the voluntary provisions in other countries have not proved entirely successful, yet efforts should be made to devise a scheme which will make adequate insurance benefits available for this section of the community.

II.—Finance.

The financial basis of the national insurance systems in operation in the various countries depends to a certain extent upon the nature of the system instituted and upon the social and economic conditions operating in the country, but is generally either (i) the distribution of the cost each year amongst the contributors on the basis of the actual expenditure *plus* a certain percentage for the formation of a reserve fund or (ii) the accumulation by regular contributions of a capital fund which will meet the estimated cost in future years.

The former or assessment method, although less costly in the earlier years, is objected to as improvident and as being actuarially unsound. It can only be applied in compulsory schemes which embrace a large membership, the standard of which will be maintained in future years, as experience has clearly shown that any scheme which provides for a variable premium in accordance with the expenditure of the fund in each year, is generally administratively impracticable.

The latter or premium system is based on ordinary insurance principles which demand that the regular contribution must be actuarially calculated as being of such amount as will provide a reserve fund sufficient to meet future anticipated liabilities, the present value of the contributions being equal to the present value of the benefits. This system is sometimes opposed on the grounds that enormous reserve funds are accumulated.

It is essential that the national insurance scheme should be placed on a sound financial basis from its inception and as the result of well-organized statistical departments adequate data is available to enable the several risks to be insured against to be fairly accurately measured and for the national insurance fund to be established in accordance with insurance principles.

(a) Method of Raising Funds.

The estimated cost of a national insurance scheme can be met in several ways and the methods by which the necessary funds are obtained vary in the several countries in which a scheme has been instituted.

Prior to the inception of any national insurance scheme, a considerable and costly burden is in existence as the result of the wage-earner's incapacity for work and the aim of national insurance is to institute a cooperative system which will distribute this burden in an equitable manner. It is generally considered desirable that all parties who will possibly benefit from the scheme, should be compelled to contribute to the funds, the cost being usually borne on a contributory basis by the insured persons and their employers with in some countries the participation of the State and or other public authorities. The Russian code is the only legislation which throws the burden of the whole contribution on the employer, whilst the only system which excludes the employer's contribution is that of Roumania. The division of the amount of contribution between employers and insured persons differs considerably in the several countries, the direct contribution by the insured person varying from one-third to two-thirds of the total contribution and the employer's contribution varying within the same limits. In the case of employees on a small wage, the employer's contribution is in the same cases increased and that of the employee decreased proportionately. The total contribution payable by the employer and the insured person is usually augmented by a Government contribution covering either a proportion of the cost of insurance or certain expenses accepted by the Government.

It has been suggested that the cost of national insurance should be a direct charge upon each industry, but a system of insurance which provides for the grouping of insured persons according to the industries in which they are employed, is unsatisfactory, as every industry cannot satisfactorily carry its own burden or pass it on to the consumer, this being especially so in metalliferous industries. It is also administratively impossible to classify the industrial population into definite industrial groups. Certain industries may possibly be able to provide similar benefits for employees within the industry at a lower cost than by the national fund, but on the other hand in other industries the cost would be considerably greater. The essential basis of national insurance is the equal distribution of the risk amongst all exposed to that risk in one collective scheme.

Some witnesses have expressed the opinion that it might be more economical to raise the funds by a system of direct taxation and to pay the benefits from Consolidated Revenue, as it is considered that if taxes were scientifically levied, the contributions would be on a more equitable basis than in the case where a direct uniform contribution is prescribed. But it is contended that as long as the Government meets the whole cost, the benefits provided will inevitably be looked upon as a gratuity or charity, whereas a scheme based on direct contributions from those who will directly benefit, is the only system which embodies the principles of insurance. The majority of witnesses stated that an equitable scheme would provide for the national insurance fund to be financed by contributions payable by the insured person, the employer and the Commonwealth.

(b) Contributions by Insured Persons.

The aim of national insurance is to assist the wage-earner to provide for future emergencies and to encourage thrift and in most countries the insured person's contri-

bution forms the essential basis of the scheme. Contributions are not usually required during periods when the insured person is unemployed or when incapacitated and in receipt of benefits and it is thus possible that the financial position of the scheme may be affected by any serious variation in the unemployment or sickness experience of insured members.

Prior to the introduction of national insurance the wage-earner bears a considerable portion of the loss arising from his incapacity to work, by lost wages and reduction in his earning capacity. Employees who are members of benefit funds operated by trade unions and mutual benefit societies, contribute to such funds voluntarily. It is not only reasonable but also equitable that every person who is likely to benefit, should contribute towards the scheme and any system which provides for insured persons obtaining benefits from a fund to which they have not directly contributed, would be most unsatisfactory. The contribution required from the worker is not usually sufficiently large to necessitate an increase in the rate of wages nor does it lower his standard of living, but the knowledge that it is his own provision for the future inspires him with a spirit of thrift and self-reliance which would be lacking under a non-contributory scheme. It has been suggested that as wages in certain industries include some provision for the maintenance of the worker when incapacitated for work, insurance contributions can be paid from that part of wages which is intended as provision for such incapacity.

(c) *Contributions by Employers.*

Contributions to the fund by employers are provided for similarly to those from employees, but the ratio of the employer's contribution to the employee's contribution varies in several countries. In some cases an additional premium is payable by the employer in undertakings where there is a particular risk of illness. Such contributions are payable for every calendar week during which the worker is employed, the employer contributing only in respect of those in his employment. It is desirable that the same rate of contribution be payable by employers for both male and female employees, so that the question of preference in employment to either sex will not arise. Contributions are also payable by the employer in respect of those employees who have been granted exemption from the scheme, it being considered that the employer's contribution should be payable according to the number of employees without regard to their individual circumstances.

The employer's contribution is regarded as the price which industry pays for its share in the diminution of the worker's capacity. A proportion of the wage-earner's sickness is stated to be due to the conditions of employment and national insurance directs attention to the need for providing for the maintenance of workers during incapacity for work and also for improving their working conditions in order to minimize sickness and accident. The employer now bears a portion of the loss arising from the wage-earner's incapacity for work by a reduction in production. In many instances employers either continue paying the wages of their employees during periods of sickness or contribute towards the cost of the establishment benefit funds which have been instituted for the purpose, or in some cases pay portion of the contributions for their employees who are friendly society members. Under an effective national insurance system the employers are relieved to a considerable extent from contributing towards benefit funds and charitable institutions. The benefits provided reduce existing expenditure on other forms of relief and a considerable amount of the money now spent in this manner is saved or diverted into more effective channels of assistance.

Contributions by employers constitute a factor in the cost of production but, nevertheless, do not necessarily result in a higher price being charged to consumers, as the cost may be met in various ways. When the employers contribute an equal proportion to their employees, they are thereby entitled to and receive an equal voice in the administration of the scheme and considerable improvement in the relations between employee and employer is stated to result from such cooperation. An employer in some cases may contract out of the scheme, where he is under obligation to afford his employees equivalent benefits to those provided by the national insurance scheme.

(d) *Government Subsidy.*

Experience has proved that wage-earners have the greatest difficulty in maintaining unaided a system of insurance which requires regular contributions over long periods and with the object of making such insurance benefits effective provision is made in most countries for the financial participation by the Government, the Government subsidy enabling benefits to be provided equivalent to the minimum insurance benefits considered necessary. Provision also is made in some countries for the local government authority to contribute to the scheme in a similar manner to the central government. The Government contribution is in the form of a fixed subsidy payable each year in respect of each insured person or based on the total amount of benefits paid. In other cases it represents a grant of a fixed or variable amount each year, whilst in others it covers the cost of the administration of the scheme. The Government subsidy is justified by the needs of the wage-earner, by the relief guaranteed and by the fact that it provides an absolute guarantee and security to the scheme. The Government now bears a portion of the loss arising from the wage-earner's incapacitation for work by the provision of institution care and of charitable assistance. In some cases it has been provided that the Government subsidy may be paid in arrears instead of in advance and this arrangement is said to be actuarially sound and avoids the accumulation of large reserves from public revenue.

(e) *Rate of Contribution.*

The contribution in respect of the insured person is sometimes fixed at a uniform rate for all insured persons, irrespective of their rate of wages, but in other countries it is proportional to wages; a maximum limit, however, based as a percentage of the wages paid and beyond which the total contribution may not be increased, is generally stated in such circumstances. This percentage varies considerably in the several countries. In some schemes all workmen are assigned to definite wage groups with a rate of contribution assessed according to their respective groups. This system of grouping insured persons according to wages and of fixing contributions in proportion to the wages earned by each group is adopted in many countries, but has the disadvantage that it is not possible to arrange satisfactory groups without rendering the system most complex and without consequently increasing the cost of administration very considerably. Experience has shown that any scheme which provides for a variable premium, is unsatisfactory and the tendency is to replace the variable contribution by a fixed premium independent of wages, although a distinction is made between the rate of contribution for male and female insured persons. Where a flat rate of contribution is applied to all insured persons the rate is based on the minimum wages paid, with a consequent minimum of benefits. In calculating the weekly contributions required, adequate provision must be made for periods in which insured persons may be unemployed or incapacitated for work and thus unable to pay contributions.

National insurance does not provide, as is the practice in commercial insurance, for a premium varying in accordance with the age of entry into insurance as the administration of such scheme would be much more complicated and costly and may prejudice the employment of those with higher rates of contribution. It is desirable that a flat rate of contribution should be adopted as such rate would be more equitable at the inception of the scheme. Where membership is compulsory, individual variation of the rate of contribution in respect of age at entry into insurance is not necessary, as the average age of insured persons is generally maintained under such conditions. The average premium method which assumes a constant age distribution of insured persons, has many advantages over other systems. If the total insured persons are to be considered as on group only for the Commonwealth, an average scheme with a flat rate of contribution would be equitable, but on the other hand such provisions have

been found to be anomalous and inequitable in those schemes which permit insured persons to group themselves into special administrative and financial sections, each with a different experience and with consequent variation in benefits available. Such sectional grouping is inconsistent with the basis of a national insurance scheme aiming at a pooling of risks.

In the British scheme the rate of contribution applicable to age sixteen is payable for all insured persons irrespective of age at entry into insurance and if a similar basis is adopted in Australia, it has been estimated that the following weekly contributions will be required in respect of each benefit recommended in our first progress report:

Benefit.	Males.	Females.
Sickness, 30s. per week	0 6·2	0 6·0
Invalidity, 20s. per week	0 2·0	0 1·4
Maternity, 20s. per week	0 1·9	..
Superannuation, 20s. per week	0 9·4	1 7·3
Child allowance, 5s. per week	0 1·5	..

No allowance for the cost of administration is included in the above estimates.

In those schemes where a flat rate of contribution based upon an age below the average age at entry into insurance and a uniform scale of benefits are adopted for all insured persons irrespective of their age at entry to the fund, a heavy initial liability is incurred at the inception of the scheme in respect of all persons who on account of age are entitled to certain benefits towards which they pay an insufficient rate of contribution. The capital sum required to meet this estimated liability is known as the reserve value and provision is generally made for liquidating this initial liability in a term of years, a proportion of each weekly contribution being set aside to form a sinking fund for the purpose. The reserve values vary for each benefit and are not required in respect of those persons who enter into insurance at or below the age for which the flat rate of contribution has been fixed. It has been stated that the introduction of a flat rate system of contributions providing for the liquidation of the initial liability makes it essential that such a system of actuarial reserves be instituted and this entails considerable record work and administrative cost. Under the approved society method of administration the question of reserve values is heavily complicated by transfers from one society to another and by changes in the status of individual members. It is one of the most complex factors in the scheme as it is necessary to calculate the transfer value of every individual. Under a national pooling system the administrative difficulties associated with transfers from section to section would be overcome.

Mr. C. H. Wickens, F.I.A., F.S.S., Commonwealth Statistician and Actuary, has estimated that if all insured persons contribute at the rate applicable to age sixteen, the following uniform weekly contributions will be required in order to liquidate the initial deficit within a period of twenty-five years, thirty-five years and forty-five years from the commencement of the scheme.

It has been suggested that where a compulsory system of insurance providing for a collective national grouping of insured persons is instituted the same necessity for the accumulation of a large reserve fund does not exist as in a system of voluntary insurance in which the individual factor is the main consideration. National insurance is a different proposition to commercial insurance. The national insurance fund is guaranteed by the Government and the annual number of new entrants into insurance is controlled, as all juniors entering into employment are compelled to join the fund which is thus constantly being rejuvenated and its composition and average experience is thus fairly constant. As it may be assumed that a national scheme of compulsory insurance once instituted would become a permanent social institution, it is suggested that it would not be essential to the solvency of the fund that the initial liability be liquidated, but that the interest on the initial liability must be met annually and certain reserves against emergency accumulated in order to avoid fluctuations in the rate of contributions. A Government scheme can offer absolute security without the accumulation of a large reserve fund. On the other hand, it is contended that, if adequate reserves are not provided against probable increased risks and emergencies, a heavy liability may be thrown on future years.

(f) *Collection of Contributions.*

The system universally adopted for the collection of contributions is that of deduction from wages at their source, whereby the employer is required to pay the whole of the joint contribution of the employee and employer and is authorized to deduct the share payable by the insured person from his wages. Under such system the onus is thrown upon the employer who is liable if an employee is not insured. This method of collection is simple, inexpensive and easily administered, the contributions of employers and employed persons being collected in most cases by means of insurance stamps, sold through the Post Office, which must be affixed by the employer to a contribution card issued by the insurance office to each employed contributor. The normal time for stamping cards is at the time when wages are paid. The due payment of contributions is supervised by inspectors appointed for the purpose. At the end of each half-year the insured person obtains the stamped card from his employer, forwards it to the insurance office and is issued with a new card.

Under the approved society system the central administration collects the revenue from the sale of stamps and acts as banker for all financial transactions involved in the scheme and is in effect a bank in which the various approved societies have current accounts. In the case of insured members who are employed in the mercantile marine, the collection of contributions by means of a schedule is favoured instead of the card system. The system of affixing stamps to cards has many advantages over that which provides for employers to pay the contributions by cheque. If a system of adminstration by approved societies or wage groups is not adopted, the same necessity for a card system does not arise, although this system is valuable for purposes of record. Nevertheless, it is essential that the insured person should have some document which is producible as evidence of title to benefits. During periods of unemployment arrangements can be made for labour exchanges to regularly record on the insured person's card the fact that he is unemployed and that consequently no contribution is required.

(g) *Cost of Administration.*

The cost of adminstration of national insurance is a very important factor and it is essential that the scheme should be so constructed that the administration costs may be kept to a minimum. The system of administration by approved societies is cumbersome and correspondingly expensive, as the societies' methods of adminstration, their administrative policies and their aims vary considerably. Under such system numerous societies may be operating in the same district with numerous competing agents and officers with consequent overlapping and an unnecessary increase in the expense of administration of the scheme.

Benefit.	Males.			Females.		
	25 Years.	35 Years.	45 Years.	25 Years.	35 Years.	45 Years.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Sickness, 30s. per week	0 0·8	0 0·7	0 0·6	0 0·2	0 0·2	0 0·1
Invalidity, 20s. per week	0 2·2	0 1·7	0 1·5	0 0·8	0 0·6	0 0·6
Superannuation, 20s. per week	1 9·4	1 5·0	1 2·7	1 9·7	1 5·2	1 2·9
Child Allowance, 5s. per week	0 0·7	0 0·5	0 0·5	..	..	..

In England the amount which may be used by approved societies for administration expenses is limited by regulation and an allowance of 4s. 5d. *per annum* in respect of each compulsory insured member, equivalent in the year 1924-1925 to approximately 9% of the total income of the scheme, is carried to the administration account of the various approved societies from the contributions paid. Any deficiency on the administration account, if not otherwise made good, has to met by a special levy. As the rate of remuneration is fixed at a flat rate per insured person *per annum* for all societies, there is no great incentive to the societies to reduce their cost of adminstration much below the fixed allowance, which is mainly absorbed by salaries and allowances to agents. Many approved societies have been able to accumulate surpluses on the administration account and also to adminster their voluntary sections more economically as the result of the inception of the compulsory system. Where the administration of approved societies has been centralized, a considerable saving on adminstration has resulted therefrom. When a society has reached a certain minimum membership essential for efficient and economical working, the addition of further members should involve a lower adminstrative cost per member and it has been suggested that for this reason the administration allowance under an approved societies' system should be on a sliding scale reducing with increasing membership. The cost of the central administration of the scheme in England, including also the cost of audit, valuations, sale of stamps, printing *etc.*, is equivalent to about 3% of the total income and the cost of administration of local insurance committees to 1% of the total income of the scheme. The total cost of administration of approved societies, local committees and central organization combined is therefore equivalent to approximately 13% of the total income of the scheme, or 6s. 5d. per insured person *per annum*.

The cost of administration of national insurance in Australia will be one of the greatest difficulties to be contended with and considerable modification of the schemes of administration in operation in other countries will be necessary in order to meet conditions in Australia. If a system of approved societies' administration is adopted, the cost of administration will depend to a great extent on the rate of remuneration which the Government decides to pay for the work done by the societies. The cost of administration of existing mutual benefit societies in Australia is heavy and varies considerably in the several societies. The total cost of administration of all friendly societies in Australia in the year 1924-1925 was £373,546, equivalent to 20% of the total contributions for the year and to 13s. 10d. per benefit member, having increased from an average of 10s. 5d. per member in the year 1915. In some societies the cost of administration is as high as 33% of the total contributions, and equivalent to 20s. 4d. per member *per annum*. This increase is said to be due to an increase in the remuneration paid to the various officials, to the extension of propaganda work in an endeavour to obtain new members and to the cost of administering the investment of accumulated funds. Although it might be anticipated that the cost of management per member would decrease as membership increased, yet it is found that the cost of management is heavier in the largest societies and has not decreased with an increase in membership. No particulars are available as to the relative cost of administration of each benefit provided. The Government Registrar has no control over the societies with respect to extravagance in their management expenses, although the societies must raise sufficient contributions to cover the cost of management in each year.

Friendly societies in Australia had 5,465 branches operating in the year 1924-1925 and a considerable amount of the administration work is being carried out voluntarily, but under a national insurance scheme incorporating an approved societies' system the cost of administration would probably be increased, as the societies would desire to maintain their present organization and consequent management expenses, whilst in addition remuneration for all officials would probably be demanded. It has been stated that in England voluntary service in connexion with the approved societies' administration of national insurance has almost entirely disappeared. The cost of paying adequate remuneration to the administrative officers of 5,465 branches and 162 head offices of approved societies in Australia would throw a very heavy and unnecessary burden on the national insurance fund.

The result of investigations show that a Government controlled national insurance system can operate more cheaply than other organizations, and if insurance in a unified national insurance fund is made compulsory in Australia, a considerable saving will be effected in agency and operating expenses. The average percentage of overhead charges for the administration of State accident insurance offices in Australia is less than 15% of the premium income and is lower than that of other offices transacting similar business. The cost of administering the Commonwealth invalid and old age pensions scheme is equivalent to about 1½% and war pensions to 2% of the total amount of pensions paid. If the question of cost of administration were the only consideration, then the national insurance scheme would necessarily be administered by similar administrative methods to those by which Commonwealth invalid and old age pensions and war pensions are now paid.

(*h*) *Payment of Benefits.*

In most countries definite conditions are prescribed which must be complied with before the insured person is eligible for the benefits provided. These conditions vary in the several countries, but in most schemes the insured persons are required to have paid a minimum number of contributions during a qualifying period before being eligible for certain benefits. A waiting period of incapacity is also generally prescribed before the payment of benefit commences and the period during which the various benefits are payable in each year is usually limited. In some cases there is a relationship between the number of contributions paid and the rate of benefit payable, but this provision involves an elaborate system of bookkeeping. It is essential that the insured person must produce proof as to his eligibility for the benefit claimed; in order to obtain sickness benefits a medical certificate must generally be produced, as proof of his bodily or mental incapacitation for work. It is usually provided that all benefits to which insured persons are entitled, are inalienable and cannot be made subject to any charge.

Where a system of administration through approved organizations is in operation the payment of cash benefits is made in accordance with arrangements adopted by the various organizations in the several countries and the method of payment varies with the type of organization approved. The most common methods are by payment at a branch office of the insurance organization, by postal remittance and by payment at the insured person's residence through a duly appointed local agent. Under a system of district administration the method of payment of benefits can be satisfactorily arranged for each district independently in order to meet local conditions. Under a unified system of national insurance all contributions are paid to a central fund from which all benefits are disbursed.

(*i*) *Investment of Funds.*

The investment of accumulated funds requires special consideration and it is desirable that such funds should be invested in works which will extend the social institutions available to insured persons and in furtherance of the aims of the national insurance scheme. The national schemes do not interfere in any way with the private funds accumulated by the voluntary friendly societies and which are invested in accordance with the rules of each society and with the *Friendly Societies Act*. Many friendly societies invest their funds with their members for the purpose of providing their own homes on a system of monthly repayments of principal and interest similarly to a building society. The accumulated funds of voluntary societies have no relationship to the national insurance scheme and no attempt has ever been made to utilize them for that purpose, as they belong solely to the societies for the purpose of providing for the members of the voluntary mutual associations.

Under the national insurance system in England one-half of the sum available for investment, representing the employer's share of the contribution, is invested by the central administration, whilst the remaining half, repre-

senting the insured person's share of the contribution, is handed over to the approved societies if they so desire and may be invested by them in such securities as they may choose, the interest earned on such investments being credited to the societies. Any interest earned by investments in excess of the interest rate adopted as the basis for the scheme is available for an extension of the benefits or a reduction of the rate of contributions.

(j) Audit.

It is absolutely essential under any system of approved society administration that Government auditors should supervise and check the work of the approved societies; this audit inspection of the accounts of numerous organizations involves considerable expense, whereas under a Government unified scheme the work could be effectively and economically supervised by the Auditor-General's Department. Although the Treasury auditors in England have striven for years to obtain improvement in the bookkeeping methods and standards of approved societies, yet in the year 1922 of 4,530 certificates issued by auditors 1,810 or 40% were qualified certificates with certain reservations. It has been stated that with respect to approximately half the insured population in England the actual amount spent in administration expenses is not subject to detailed audit by the Government auditors. Although the insurance funds are statutory funds and may be used only in accordance with the provisions of the Act, yet the audit provisions do not include the power of disallowance and surcharge in the case of improper expenditure by approved societies. The present system generally as regards the auditing of branches of friendly societies in Australia is not entirely satisfactory. The branch auditors are appointed by the branch members and it is not always necessary that the Government Registrar should approve of such appointments. In cases where the Registrar has appointed an officer to make an inspection of the books and records of a society a very appreciable improvement has usually resulted. The audit of the central accounts of friendly societies, however, is generally made by qualified accountants.

(k) Actuarial Valuations.

Valuations by actuaries which show the results of the working of the scheme, are made normally at three-yearly or five-yearly periods on such basis as may be prescribed. No profit may be made by an approved society and any surplus found at a valuation is disposed of by increasing benefits or by reducing contributions. Where the approved society method of administration is in operation a separate valuation in respect of every approved society must be made, and this throws a tremendous volume of work upon the actuarial staff, and is a very costly process when compared with the valuation of one centralized fund or of a limited number of district funds. Unless very special reasons arise, it is unnecessary to value the district sections of a unified national fund separately, as the benefits are exactly similar for each insured person irrespective of the district in which he resides. Separate valuations are inconsistent with the principle of a unified national system of insurance.

(To be continued.)

Obituary.

JAMES MATTHEW PETRIE.

By the death of James Matthew Petrie the medical profession has suffered a very considerable loss. He was well known to students and those graduates who kept in touch with the school of physiology of the University of Sydney. His earnest demeanour, his retiring disposition and his unswerving attention to his scientific work prevented him from becoming a popular figure at the University. His intimate friends, however, set a very great value on these attributes and held him in higher esteem than if he had been able to seek local fame in social circles. He was always the essence of courtesy to strangers and to acquaintances and was appreciated by many as a charming and interesting companion.

James Petrie was born in Edinburgh in 1872. He attended the Heriot Watt School and College in his native city. After having completed his schooling he entered the Edinburgh University where he studied science. He paid particular attention to chemistry. After a couple of years he left Edinburgh and came to Australia. He was twenty-four years of age when he started work at the University of Sydney. He took the science course and graduated as bachelor of science in 1901. In 1905 he secured the degree of doctor of science. Two years previously he was elected a fellow of the Institute of Chemistry and in 1904 he gained the Caird Research Scholarship. When he arrived in Australia he acted as junior demonstrator in chemistry at the University of Sydney. From 1898 to 1901 he was lecturer in chemistry and assaying at the Technical College in Sydney. His early work was concerned with the investigation of the chemical nature of local kerosene shale and its products. This work was recognized as essentially sound and held out promise of a very useful career. After graduation he returned to England for a time. He then found that the problems of biochemistry had a peculiar fascination for him and on his return to Sydney he devoted himself almost entirely to this branch of his science. He studied the biochemistry of many Australian plants. The nitrogen metabolism of some of these plants claimed his attention for a time. He examined the poisonous alkaloids of solanaceous plants and described several newly discovered alkaloids. About this time he was appointed a Linnean Macleay Fellow. He held this position for a period of seventeen years. A record of his valuable contributions to applied chemistry can be found in the *Proceedings of the Linnean Society of New South Wales* from 1908 to 1924. Among these may be mentioned one on the hydrocyanic acid glucocides and other constituents of plants poisonous to cattle. While working with some of these toxic substances his health began to deteriorate. He was ill for a considerable period, but recovered sufficiently for him to take up his work again. Plant pigments formed the next group subject for investigation. He attacked the flavones, their relationship to anthrocyanins, coloration by tannin compounds and so on.

In 1924 James Petrie was appointed Bosch Cancer Research Fellow and he held this position until the time of his death. In February of last year he published in this journal a preliminary paper on the staining of intercellular substance in which he manifested much ingenuity and a sense of the biological significance of cellular constituents. The discovery of a particular potassium compound in the cement substance binding endothelial cells together is probably of greater importance than would appear at first sight. He was unable in recent times to work at high pressure on account of the state of his health. He found it necessary to rest and thus conserve his energies.

He married a fellow student in the year 1898. His wife and three children survive him. The eldest is a graduate in science of the University of Sydney who holds the position of senior demonstrator in botany at the University of Melbourne. The second son and the daughter are endowed with high musical gifts. His own tastes were centred in music, art and the quiet enjoyment of family life. We offer to his widow and family the sincere sympathy of the medical profession.

Post-Graduate Work.

POST-GRADUATE COURSES IN BERLIN.

INTERNATIONAL post-graduate courses in medicine will be held in Berlin by the Union of Professors and by the organization centred in the Kaiserin Friedrich Institute with the assistance of the medical faculty of the University of Berlin. One section of the courses will be held continuously and another section during the period from September 15 to October 31, 1927.

The continuous section will comprise individual courses in all branches of medicine with practical exercises usually lasting four weeks. In connexion with these courses "externships" in clinics, hospitals and laboratories will be available. These are intended chiefly for medical practitioners desirous of working under practical conditions for a longer period of at least two to three months.

The second section from September 15 to October 31, will include (i) general courses in all the branches of internal medicine with special regard to modern therapy (duration fourteen days), (ii) general courses in diseases of the stomach and intestine, (iii) general courses in pædiatrics, (iv.) general courses in gynæcology, (v) special courses in medical technique at the bedside and in the laboratory with practical exercises and demonstrations, (vi) special courses for specialists in diseases of the ear, nose and throat, (vii) individual courses in all departments of medicine with practical work.

The medium of instruction will be German, but a number of the lecturers will be able to give instruction in English, French or Spanish.

The bureau will be glad to furnish information in regard to accommodation and the cost of living and also to arrange facilities for seeing operations in clinics and for similar services.

Medical practitioners who contemplate undertaking post-graduate work in Germany, are advised to communicate with the bureau of the Kaiserin Friedrich Institute at Kaiserin Friedrich Haus, 2-4, Luisenplatz, Berlin, NW. 6.

THE MEDICAL BENEVOLENT ASSOCIATION OF NEW SOUTH WALES.

THE following report has been issued by the Honorary Treasurer of The Medical Benevolent Association of New South Wales.

While we are very grateful to those members of the profession who have enabled us to more than double our funds in the space of nine months, we cannot but deplore the fact that only 217 out of 1,590 members of the New South Wales Branch of the British Medical Association have responded to the call of benevolence. We owe a debt of gratitude to Dr. William Chisholm for his generous gift of £323 to our funds. Dr. Chisholm's generosity has enabled us to start our list of benefactors and I am sure that we could not have a better name to head the list than that of William Chisholm. We hope to be able to add at least one name to this list in each ensuing year.

We are also indebted to the South Sydney and the Eastern District Medical Associations for donations of £10 and £5 5s. respectively, also to the local honorary secretaries of the Western Suburbs and the Central Northern District Medical Associations for valuable help in collecting subscriptions and to an anonymous donor of £25.

Now that the Benevolent Associationis firmly established on a sound basis, we hope to obtain many more subscribers every year.

E. S. LITTLEJOHN,
Honorary Treasurer.

Correspondence.

THE RED BACKED SPIDER BITE.

SIR: There is a proverb about giving a dog a bad name *et cetera*. Therefore, Dr. Lethbridge in his letter in your issue of April 30 quotes the recent spider bite fatality as one more instance of the villainy of the red back spider. *The Sun* of February 23 gives an account of the inquest and also an illustration of the mangled remains of the spider that did the deed.

This spider was identified at the Museum as a black trapdoor spider, *Enetimena tibialis*, a spider about one and a half inches long and in no way related to the red back spider.

It is to be hoped that the other cases referred to in the letter are better authenticated.

There is an article in *The Guardian* of February 18 in which mention is made of a series of experiments by Dr.

BALANCE SHEET AS AT DECEMBER 31, 1926.

LIABILITIES.	£ s. d.	ASSETS.	£ s. d.
Capital Account as at March 26, 1926	646 18 0	Cash Accounts—	
Add Surplus for the year ended December 31, 1926, as per Income and Expenditure Account	777 11 7	Commercial Banking Company of Sydney, Limited	42 8 2
		Government Savings Bank	482 1 5
		New South Wales Government Funded Stock	900 0 0
	£1,424 9 7		£1,424 9 7

INCOME AND EXPENDITURE ACCOUNT FOR YEAR ENDED DECEMBER 31, 1926.

	£ s. d.	£ s. d.		£ s. d.
To Printing	22 9 0		By Donations	274 3 5
„ Macnamara & Smith	14 14 0		„ Annual Subscriptions	176 8 0
„ Stamps and Petty Cash	10 0 0		„ Life Members	521 17 0
„ Bank Fee	0 10 0		„ Exchange Added	1 0 7
„ Cheque Book	0 4 2		„ Interest of Investments	27 0 8
„ Exchange	0 0 6			
„ Assistance to Beneficiaries	175 0 0			
		222 17 8		
„ Surplus for the year transferred to Capital Account		777 11 7		
		£1,000 9 3		£1,000 9 3

Auditors.
H. HAMILTON MARSHALL,
JOHN MACPHERSON.

E. S. LITTLEJOHN, Hon. Treasurer.

Frank Tidswell on the effects of the bite of the red back spider on mice. He found that after being bitten "recovery was complete in remarkably quick time."

I may mention that I have handled these spiders on many occasions for years past and have not yet succeeded in making one bite me.

Yours, etc.,

F. A. RODWAY.

Nowra, New South Wales,
April 30, 1927.

TREATMENT OF SNAKE BITE.

SIR: I have read with interest Dr. Watkins's letter in your issue of April 30 on this subject and for reasons which will appear later, I venture to express the opinion that his aboriginal patient was not suffering from the consequences of snake bite, but from sheer fright, for if he had been inoculated with snake venom (particularly by a tiger snake) the loosely tied ligature would not have prevented the rapid absorption of the poison. Consequently he would certainly have died long before he was taken to the doctor's surgery.

I notice that the fetish of scarification of the skin and application of potassium permanganate crystals to the wound so caused was carried out. This method of treatment is useless and ineffectual—the idea being apparently to oxidize the venom *in situ*. The venom, however, is lying in the subcutaneous tissues, not in the skin surface and therefore is not reached by the drug, as the scarification does not in any case cut through the skin.

A snake bite implies the subcutaneous injection of the venom and, unless that occurs, the patient will be found to be suffering from and may die of fright purely. To insure subcutaneous inoculation, the patient must be viciously bitten by the snake—the fangs must penetrate through the skin and, as the average bushman knows, to get rid of the snake means dislodging him violently from the part attacked, usually accomplished by shaking him off. Many persons are brought to a medical man, persumably suffering from snake bite. They show a couple of punctures, but give no history of the snake actually adhering to the part. These persons must be treated for the terror inspired by the presumption that they have been bitten, not for snake bite.

The first aid treatment of snake bite consists primarily in the application of a tourniquet sufficiently tightly on the upper arm or thigh as to absolutely obliterate the circulation distal to same. If this is performed satisfactorily immediately following on the snake bite, the patient will remain perfectly well until the tourniquet is released, when a most alarming train of symptoms will ensue—vomiting, collapse, proceeding to death.

The average man considers that after first aid treatment is applied, nothing else remains to be done, but to stimulate the patient, using strychnine, alcohol, *spiritus ammoniæ aromaticaus et cetera*. No thought is given to the ultimate disposal of the tourniquet and the effect on the patient of removal of same.

The fallacy of using potassium permanganate locally is shown when we consider that a snake bite is comparable to a hypodermic injection of morphine. Who would attempt to chemically destroy the morphine so injected by scarification of the skin at the site of puncture and the exhibition of potassium permanganate in crystal form? The bulk of the morphine is lying in the subcutaneous fat at a considerable distance from the external puncture and quite out of reach. So with the snake venom, as I have already stated.

We have thus to consider how long should the tourniquet remain on the limb and what method should be adopted to remove same with ultimate safety to the patient.

I have had the opportunity of treating two definite cases of snake venom inoculation with recovery in each case. In the first case I used potassium permanganate in conjunction with other methods and it took about three months for the ulcer caused by the drug to heal.

The method of treatment adopted was suggested to me by my colleague at the time, Dr. J. J. Gilchrist, now of Dungog, who had had experience of it at the Coast Hospital during his residence there. It consists in allowing small doses of the venom to enter the general circulation at regular intervals (usually twenty minutes at the commencement of treatment). After each dose—given by releasing the tourniquet momentarily and immediately reapplying it to again obliterate the circulation—it is necessary to treat the intense collapse that ensues, the violence of which diminishes with successive doses of the venom so introduced. The collapse is to be treated by ordinary methods, "Pituitrin," *spiritus ammoniæ aromaticus et cetera*. It is a marked feature of the invasion of the systematic circulation by fractional doses of the venom and is most alarming.

The length of time occupied in acquiring immunity is from twenty-four to thirty-six hours. The patient shows that he is becoming immune when the time during which the tourniquet remains released becomes longer without causing collapse. The onset of collapse is the signal during the later stages of treatment for reapplication of the tourniquet.

There is not any great danger of permanent damage to the limb from the constant pressure of the tourniquet. As the limb is flooded at intervals with arterial blood, though the subsequent bruising and pain are intense and may detain the patient in hospital indefinitely. Each of my patients treated in this fashion had no recollection of the steps of the treatment although they were not actually unconscious during the course of treatment. When it is possible to leave the tourniquet off without collapse ensuing, the treatment may be discontinued and general treatment designed to promote the patient's well-being adopted. The patient should be fit to leave hospital in three or four days or longer, dependent solely on the amount of trauma sustained by the limb from the use of the tourniquet.

In any part of the body not fitted for the use of the tourniquet, the only rational treatment is immediate excision of the tissue containing the venom, at the same time expressing a pious hope that no venom has been left behind. A further suggestion for treatment in hospital is the inhalation of oxygen, thereby flooding the blood stream with the gas which has the power of breaking down the venom. This would seem a more reasonable method of exhibiting oxygen than by the local application of potassium permanganate to the scarified skin.

In the same issue of your journal, Dr. Lethbridge writes that he has seen cases of snake bite in which no treatment has been adopted prior to the patient's arrival at his surgery. I can assure Dr. Lethbridge that these patients, fortunately for themselves, had not been inoculated with snake venom. The condition resulting from such inoculation is so alarming that no medical man who has seen a genuine case, would ever mistake it or even wish to have the responsibility of treating another. I, myself, have seen a number of cases of presumed snake bite. When I elicited the history that the snake had not actually adhered to the punctured part, I have felt justified in informing the patient that he has not been inoculated. Thus allaying his fears, I then prescribed a good stiff glass of spirits which has proved to be all the treatment necessary.

To summarize:

1. The snake must inject the poison subcutaneously.

2. To do so he must bite into the tissues and actually adhere to the part bitten.

3. Efficient first aid treatment must be immediately adopted to absolutely oliterate the circulation at a level proximal to the puncture.

4. Fractional doses of the venom must be cautiously admitted to the general circulation until immunity is acquired.

5. The intense collapse following on each dose must be suitably treated.

Yours, etc.,

A. MACINNES.

Collaroy, New South Wales,
April 30, 1927.

Books Received.

TEN WEEKS WITH CHINESE BANDITS, by Harvey J. Howard, M.D.; 1927. Australia: Cornstalk Publishing Company; Sydney: Angus and Robertson, Limited. Crown 8vo., pp. 288, with illustrations. Price: 6s. net.

COMPENDIUM OF REGIONAL DIAGNOSIS IN AFFECTIONS OF THE BRAIN AND SPINAL CORD, by Robert Bing, Translated from the Sixth German Edition by F. S. Arnold, B.A., M.B., B.Ch. (Oxon.); Third Edition; 1927. London: William Heinemann (Medical Books), Limited. Crown 4to., pp. 219, with illustrations. Price: 15s. net.

SURPLUS FAT AND HOW TO REDUCE IT, by W. F. Christie, M.D.; 1927. London: William Heinemann (Medical Books) Limited. Demy 8vo., pp. 114, with illustrations. Price: 6s. net.

HERNIA AND HERNIOPLASTY, by Ernest M. Cowell, D.S.O., M.D., B.S. (London), F.R.C.S. (England), with an Introduction by Sir Arthur Keith, F.R.C.S., F.R.S.; 1927. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 144, with illustrations. Price: 9s. net.

Diary for the Month.

MAY 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 25.—Victorian Branch, B.M.A.: Council.
MAY 26.—New South Wales Branch, B.M.A.: Branch.
MAY 26.—South Australian Branch, B.M.A.: Branch.
MAY 27.—Queensland Branch, B.M.A.: Council.
JUNE 1.—Victorian Branch, B.M.A.: Branch.
JUNE 1.—Western Australian Branch, B.M.A.: Council.
JUNE 3.—Queensland Branch, B.M.A.: Branch.
JUNE 7.—Tasmanian Branch, B.M.A.: Council.
JUNE 9.—South Australian Branch, B.M.A.: Council.
JUNE 9.—Victorian Branch, B.M.A.: Council.
JUNE 10.—Queensland Branch, B.M.A.: Council.
JUNE 14.—Tasmanian Branch, B.M.A.: Branch.
JUNE 14.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 15.—Western Australian Branch, B.M.A.: Branch.
JUNE 16.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 20.—New South Wales Branch, B.M.A.: Organization and Science Committee.

Medical Appointments.

Dr. W. M. Sinclair (B.M.A.) has been appointed Acting Official Visitor, Hospital for the Insane, Toowoomba, Queensland.

* * * *

Dr. Godfrey James Byrne (B.M.A.) has been appointed Government Medical Officer at Gladstone and a Health Officer under *The Health Acts*, 1900 to 1922, Queensland.

* * * *

Dr. Raleigh Clarke (B.M.A.) has been appointed Certifying Medical Practitioner at Smythesdale, Victoria, under the provisions of the Workers' Compensation Acts.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xx.

BALMAIN AND DISTRICT HOSPITAL: Honorary Diathermist.

GOVERNMENT OF WESTERN AUSTRALIA: District Medical Officers (Two).

MOTHERS' AND BABIES' HEALTH ASSOCIATION, ADELAIDE: Honorary Medical Officer; Medical Lecturer.

REPATRIATION COMMISSION: Medical Officer.

ROYAL AUSTRALIAN NAVY: Medical Officer.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY: (1) Resident Medical Officer; (2) Junior Resident Medical Officer.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY: Honorary Medical Staff.

STAWELL HOSPITAL, VICTORIA: Junior Resident Medical Officer.

WOODENBONG DISTRICT, NEW SOUTH WALES: Medical Practitioner.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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